The Builder.

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ILLUSTRATION.

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The Byron Monument Competition.

THE first series of designs, of which we gave a brief notice last week, are still on view at the Kensington Museum, and we take the opportunity to offer one or two observations on this important competition, beyond what our space allowed of last week. In the first place, we believe we are correct in saying that the second competition is to be an open one, and not confined to the authors of the six designs selected for commendation, though they are specially invited to be among the number. This is satisfactory in one respect, since, without quarrelling with the award of the committee, a further inspection convinces us that there are others besides the favoured five (two of the six designs are by one artist) whose co-operation in the second competition would be very desirable on the ground of the artistic ability displayed, though their present ideas may be unsuitable. The five selected sculptors may nevertheless complain of want of justice in the proposed opening of a fresh competition, and most righteously so, indeed, if others than those who have already competed are to be allowed to enter with the enormous advantage of seeing all that has been done, and hearing all that has been said. A word now as to the conditions of the competition, and the question of adherence to them. This has not been strictly observed by competitors at all. The first circular issued was rather vague, in regard to scale, merely stating that the models were "not to exceed 3 ft. in height," leaving it optional how much of this was to be occupied by the figure. The second circular, which we presume was issued not long after the first (there is no date to either document), gives the much more sensible guide of a special scale for the figure, 2 ft. To judge fairly between one design and another, it is absolutely essential that the same scale of figure should be preserved. But in the present competition there is quite a wild irregularity of scale; in some cases the figure is hardly 1 ft. in height; in one design (No. 2) it is about 4 ft., and the whole thing stands about 8 ft. high from the floor, thus directly transgressing both sets of conditions. This work probably owes its position in the competition and in public favour, to some extent, to the effect produced by its scale. It is amongst the selected six, whereas, in strict justice, it should have been disqualified. The one which was placed first, again (No. 6), though, as we have said, a very admirable figure, ignored the condition that there should be "an appropriate pedestal." The artist has, in fact, saved himself the trouble of a pedestal, and devoted all his attention to the figure, which is more highly finished than most of them; but this is hardly fair to other competitors who have devoted some trouble to considering and elaborating the pedestal. The same remark would apply, to some extent, in the case of Nos. 27 and 28, where the author has contented himself with drawings only of the architectural portion of his designs, which do not, of course, show the effect in the same way that a model would, and are much more easy and inexpensive to execute. In arranging the second competition, we think the committee should reassert as distinctly as possible the conditions as to scale, and as to the precise amount and method of work to be sent. It ought not to be optional to send a drawing only of the accessories without a model. The whole should be on the same footing; though, of course, if a competitor chooses to send a drawing in further illustration of the intended effect of his work, there can be no harm in that. Another point is that as the model is judged of, in the main, by the character of the principal figure, it would be desirable in a future exhibition of the new competition designs to arrange them so as to bring the figures more nearly to an average level, and put them in the same position in regard to the eye. The difference is very great in the present exhibition.

The first circular left a choice of material; either "bronze, Sicilian marble, or Pentelic marble" (which latter we observe is spelt "Pentellic," a barbarism that we hope will not be repeated in the new circular, if the word has to be used). In the second circular, upon which most if not all of the present designs seem to be professedly based, the pedestal is decisively specified to be of marble, which it appears the Greek Government intend to give, and the figure of bronze. This consideration has perhaps led to the great development of the pedestal in some of the designs, from a prudent resolve to make as much as possible out of the liberality of the Greek Government. As to the question of the material generally, a single bronze statue on a marble pedestal does well enough, of course; but the case seems different when figures are introduced on the pedestal. It would be out of place to bestow a finer material on the accessory figures than on the principal one; but, on the other hand, the bronze figures connected with a marble pedestal look too *unconnected*,—as if they did not belong to the work, and had sat down there by accident, or chosen to climb up and stand there. This effect may be seen in some of the models in which the materials are shown realistically, and which have a very broken and spotty effect; though no doubt that great blending and harmonising agent, London smoke, might be trusted to remove this in no very long time. The gift of the marble for the pedestal, and the use of bronze for the figure, seem to indicate a decidedly large scale for the work, in comparison with the means at present counted upon. We can scarcely, however, see the desirability of restricting the material for the principal figure to bronze; it would surely be well to allow the option of marble, especially as the style of some artists lends itself better to marble than bronze, and it is possible that a better result would be obtained by leaving the competitors more unfettered as to material. The facts which we published the other day concerning the condition of the Achilles statue suggest, moreover, the doubt whether metal be the most durable material in our modern London atmosphere.

In regard to the accessories of the statue, the present competition suggests some points worth attention. In the first place, all such rubbish as artificial rocks and rustic pedestals should be utterly condemned; there are some ridiculous things of this kind in the competition, though the judges, certainly, have not favoured any so far. To make the public in general understand why such a thing is absurd seems hopeless, we admit. In the second place, architecturally-constructed pedestals should be treated with more consideration of architectural propriety of design and detail than is shown in most of these. It is an entire misuse of architecture to seat a statue on the top of a temple, as in the case of one design, not without merit, in which the poet is seated on the top of a modification of the Lantern of Demosthenes. Nor are architectural details to be clipped and cut about by sculptors in a manner which argues ignorance or neglect of the origin and meaning of such details. As a flagrant instance, we may mention one design which has coupled Doric columns at the angles, supporting a piece of cornice without the architrave and frieze, the cornice coming right on the capital of the column, while the "composition" is decorated above the cornice by square finials over each column, looking like the top of a joiner's stair-newel, and utterly alien from everything in Greek architecture. Other pedestals which are better in idea are spoiled to some extent by want of familiarity with architectural detail, and others show a complete forgetfulness of the relative scale implied by certain classes of architectural detail; No. 23, which we a little too hastily commended for originality (which it has, certainly) in our former hurried notice, is an instance of this, as it employs on a very large comparative scale, details (such as scrolls and foliage) which are generally used in architecture on a smaller scale; with the effect, of course, of dwarfing the figures. One of the best-designed pedestals in the room is the one to the large No. 2, before mentioned; this is apparently a French work, and the French have a much better perception of the fitness of things in such accessories than we generally find among English artists. Then, of course, there is the question between a mere pedestal and an architectural background or canopy. This is to some extent a mere question of expense; and we may recal Allan Cunningham's opinion expressed to the late Sir Robert Peel, in reference to a similar case,—"Don't starve the statue!" Apart from that we should earnestly strive for something like an architectural erection of which the statue should be the central point; it has a more dignified effect, and gene-

rally acts, also, as a preservative to the statue. The question between a niche, in which the figure would only be seen in front, and an open canopy, which would allow it to be seen all round, is practically suggested by the collection of models; the former is by far the easier problem for the sculptor, and can be efficiently carried out for a less sum than the latter scheme; only when we find artists pointing out that a statue should never be seen all round, and that it must have a bad effect from the rear, we must add the proviso, "unless it is so designed as to look well all round," and may recall Thorwaldsen's determination that his works should be so seen, and how he surreptitiously made his Apostles just too high for their intended niches, after having in vain tried to argue them out of the niches in the face of the opposition of his committee. However, as the funds for the Byron memorial stand at present, we fear it would be useless to look for a canopy, which must be a large erection or it will smother the statue. The danger of a low canopy is unintentionally but forcibly exemplified by one of the designs in this very competition,—No. 37. This is a single figure under a gracefully-designed simple Greek canopy with a flat ceiling and a column at each angle (the poet's faithful dog bears him company on the *top* of the erection, rather oddly); the artist gives a duplicate of the figure, one standing under the canopy, which casts a shadow on him, the other free; the two are identical, but the one under the canopy seems an absolute nonentity from the nonaccentuation of the features, and could scarcely be believed to be the same model. The fact shows the importance of having a model of the whole accessories, and not trusting to drawings.

The alternative to a niche treatment (if an architectural canopy is out of the question) would be to leave the statue perfectly free, but to give dignity to it by an extended treatment of the base or pedestal, with or without figures. By this method an admirable pyramidal composition may be made, and which gives opportunity of an added intellectual interest in the accessories. Only, one thing must be remembered: that subsidiary figures, if on a different scale to the principal one, must be so treated, either as bas-reliefs in panels, or in some other decidedly different manner from the principal figure, as to remove them entirely from immediate connexion with the latter. To place upon the lower part of the pedestal figures treated in the same manner as the central figure, and even in directly connected action, but on a different scale, is a blunder so extraordinary, and so absurd in its results, that it would seem unnecessary to say a word in condemnation of it, did we not see instances of what even clever sculptors will do sometimes in this way.

Of the six preferred designs mentioned in our last, it is pretty generally understood that No. 6 is by Mr. Storey; No. 14 by Mr. Boehm; Nos. 27 and 28 by Mr. Williamson. No. 9, which has a very elaborate bas-relief on the pedestal, as well as most extensive architectural surroundings shown in a drawing, is understood to be by Count Gleichen: it is extravagant as to cost, of course. The figure is bright and life-like in expression and attitude, but to our thinking there is more of the "happy peasant-boy" than of Byron about it. Among those which we have not previously mentioned, and which deserve a word, is a model on a small scale, No. 17, evidently by a French sculptor,—a remarkably good composition; the pedestal is a cross on plan at the lower part, with four seated figures illustrative of the poems; those of Don Juan and Manfred are especially good: the principal figure is not remarkable, but the whole gives a very good impression. No. 21, a seated figure, is in too stooping an attitude,—not quiescent enough for sculpture, but it is not commonplace; the head and countenance have been carefully studied, and it is among the most successful in this point, giving strongly-marked character without going into heroics. Even this latter excess, however, would perhaps be better than the very quiet countenance and manner which some of the most favoured competitors have adopted for the principal figure. One of the most marked characteristics of Byron was, that he was what would now be called an "anti-Philistine"; he had nothing to do with British respectability; nothing could be worse than to stereotype, in bronze or marble, a "genteel" Byron; and the taste of the committee seems too much to incline that way. Another design worth attention is No. 40, also we suspect) French; the figure of Byron is, as Dugald Dalgetty would have said, "alighted or overcrowed" by that of Fame, which is grouped with him,—a mistake, perhaps, but there is a certain power and effect about it; and the circular pedestal with alto-relief figures is (except for some lapses in architectural detail) very good; the figure representing "Greece," writing the poet's name, is admirable, and sketched in with a masterly hand. Some of the designs submitted are indeed fearful and wonderful; but as they have not a chance of execution, it is not necessary to undertake the unpleasing task of characterising them more particularly.

His lordship's own impressions of the designs for his monument, which have been kindly communicated to us, we print in another column.

TUNNELLING.

However justly we may despair, at the present day, of any prospect of excelling, or even of rivalling, the purity, elegance, and majestic splendour of the temples of Classic Greece, or the loving, patient, picturesque work of the founders of the Mediæval cathedrals and abbeys of England and of France, there is one department of the work of the builder in which the nineteenth century may hold its own, when compared with earlier Christian or pre-Christian dates. That work, indeed, in our present minute division of labour, is attributed to the engineer rather than to the architect. But it is truly structural work; and not only so, but it is often executed under circumstances that call for the fullest display, both of scientific knowledge and of practical skill, demanding the ready adaptation of apparently small means to ensure great ends. Not that we are by any means justified in considering that we have made an unmeasured advance on the practice of those master-builders, the Romans, even in our tunnels. In one or two instances, indeed, we have accomplished, or attempted, tunnels of greater magnitude and difficulty than any with which we are acquainted in times past. If we confine our views to the simplest form of subterranean gallery, that of the miner, there is no doubt that both in the depth to which we have sunk, and the distance which we have penetrated from the bottom of the shafts, the mines of modern times are far more prodigious works than any with which we are acquainted that preceded them. But when we come to true tunnels, subterranean perforations lined with brickwork or masonry, it is rather to our unacquaintance with the ruins of the ancient Roman works than to the non-existence of such works that we owe any feeling but that of great respect for our Italian masters. The long and lofty viaducts that span many a valley in Italy and southern France are conspicuous objects. Even in their ruins they are magnificent. But the tunnels, which formed a part of some of those long water-courses, are less apparent; often, the only parts which would betray their existence,—the mouths,—have been buried by earthquake or by landslip. Yet we all know how the great *cloaca* of Rome have resisted pressure, decay, and wear, for much more than two thousand years. We have ourselves traced, in the spurs of the Apennines, long stretches of carefully-built tunnel, lofty enough to allow a man to walk in them erect, perfect for the conduction of water as on the day on which they were completed, floored by 10 in. or 20 in. of a fine silt, that shows for how long a period they must have fulfilled their object,—and yet so forgotten that it is uncertain to which of the rich and flourishing cities of the Campanian plain,—Herculaneum, or Stabiæ, or Pompeii, or Pagani, or Nocera,—they formerly conveyed an ample stream. In referring to these Roman works, we must bear in mind that the more intimately we are acquainted with their details, the more sturdily shall we hesitate to adopt the current idea that it was ignorance of the simple laws of hydraulics that led the ancient architects to carry water over long, level, open aqueducts, instead of descending and ascending hills by pipes and syphons. It is ridiculous to suppose that the Romans were unacquainted with the hydrostatic law that underlies the soundness of any hydraulic work. Although they may not have been informed of those properties of iron which have been discovered and developed in this country since the first cast-iron railing was erected around the Cathedral Church of St. Paul, they could make pipes and connexions as they thought fit. There is a large bronze cock in the Museum at Naples, recovered from Herculaneum, which formed the connexion of a pipe (speaking from memory) of 9 in. or 10 in. diameter, in which water is yet inclosed,—water that has been contained in that brazen chamber for 2,000 years. And the command of earthen material, pozzuolana, and cement, still retained by the Italian builders is such as to leave no difficulty in constructing conduits that will bear a heavy head of water, if such are required. It is rather on a balance of advantages, as building for centuries, not for years,—above all not by contract,—that the Roman architects laid out their viaducts *au jour*, and only employed tunnels where it was necessary to pierce some transverse spine of hill. Our own experience of such matters as the silting up of sumps and syphons, of the rapid erosion of iron pipes by hard water, of the consequent deposit of sinter in these pipes, and of the unsuspected fact that a deep fall of water very rapidly erodes and destroys iron, is enough to lead us to the opinion that, perhaps, after all, the water-lead system of Imperial engineers was quite as scientific, and quite as practically economical, as is that of the present day.

Our attention has been drawn to this interesting architectural subject by a republication of the very excellent work on Practical Tunnelling, by Mr. F. W. Simms, C.E., with much additional matter, contributed by Mr. D. Kinnear Clark, illustrative of the great Alpine Tunnels, one of which was opened in 1871, while the other is still in course of construction.* Mr. Simms, resident engineer on the South-Eastern Railway, has given an account of the Bletchingley and Saltwood tunnels on that line, which is quite a model for that kind of monograph. He has first described the geological features of the country to be traversed; then gives a general outline of the design of the tunnels; explained the construction of the observatories built for determining the centre line; the transit instrument fixed and adjusted on its solid brick pillar; the setting out of the shafts; the ranging of the line both above and underground; the determination of the levels; the sinking of the shafts; the driving of the headings, the excavation, timbering, and lining of the tunnels; the tunnel entrances, shaft towers, and culverts; the frames and centreing employed; and the labour and cost of construction. In tracing the careful details thus placed on record, it is interesting to remark how closely the experience obtained by Mr. Simms on the South-Eastern Railway resembles that of Mr. Robert Stephenson and his assistants on the London and Birmingham Railway. Each engineer seems to have started with about the same amount of information,—that, no doubt, yielded by the best text-books of the day. Each, under similar circumstances, was driven to adopt certain modifications of his original views. Yet the earlier experience of Mr. Stephenson does not seem to have been made available for the guidance of Mr. Cubitt and Mr. Simms. The sinking of the shafts of the Bletchingley tunnel was commenced in the beginning of August, 1840. Mr. Stephenson's long tunnel at Watford was commenced in 1834. Observatories (three in number) and a transit instrument, exactly resembling those figured by Mr. Simms, were erected for the setting out of the Watford tunnel, and proved entirely useless, as the line run over the ground by the theodolite was accurately true, and was actually used for giving the points below ground. It is curious to see how in this, as in other instances, the distance of a few miles of country, or a year or two of time, prevented one engineer from effecting a considerable saving, both of time and cost, by acting on the experience of his predecessor. Mr. Clark, in his preliminary chapter, cites the experience of the Primrose-hill and the Kilsby tunnels, as showing the action of clay. If the cutting was left for a few days without having the brick arching completed, the timbers were broken. In the former case, the expansion arising from air appeared to be nearly the same as in the latter case from exposure to water. In the construction of the former tunnel, the lengths were limited to 9 ft., and strongly timbered until the arching was complete. But the clay, acting as a semi-fluid, exerted so great a pressure on the brickwork as to squeeze the mortar from the joints, to bring the inner edges of the bricks into contact, to grind them to dust by degrees, and to reduce the dimensions of the tunnel slowly but irresistibly. The danger had to be met by using very hard bricks, set in Roman cement, in three 9-inch rings. Yet on the commencement of the

* "Practical Tunnelling: Explaining in Detail the Setting out of the Works, Shaft-sinking and Heading, the Brickwork of Tunnels, &c." London: Crosby Lockwood & Co., Stationers' Hall-court.

Primrose-hill tunnel an attempt was made to save the cost of the invert, because in the Watford tunnel, made through solid chalk, it had been found possible to dispense with this troublesome portion of the section. Even this experiment might have been anticipated by consulting the experience of practical well-sinkers. Mr. Clark tells us that the London clay has a notorious reputation with these workmen. Even in the absence of moisture, if left exposed to the atmosphere, it swells and bulges upwards. A well at Richmond, of 4 ft. in diameter, was completely closed in one night by the swelling up of the bottom, although there was not any water in it. In the same way, in the construction of the Tower-hill tunnel, if the shield was not rapidly advanced as soon as the excavation was ready to receive it, it became almost immovable from the binding of the clay. And yet provision was made for filling up the inch or two of space, which in a few hours would have filled up of its own accord, with the destructive material, grout. It is evident that works which give full accounts of all the numerous details obtained from actual experience, are of the utmost value to the engineer.

While it is thus important to collect and to set in order the whole experience of a single school, or of a single country, on one great branch of structural work,—as, for instance, in the account of the English tunnels,—such a book is rendered of far more value when, as in the present case, it includes information as to the progress of the most important foreign works of a like nature. Such information is valuable, often, in proportion to the difficulty with which it is obtained; or with which, in some cases, it is sought in vain. Thus it would be of great importance to engineers and contractors in this country to be made acquainted with the actual cost, per cubic yard, of the excavation of the Suez Canal. But the best study that can be given to the reports of the company, or to the two or three books that have been published in England on the subject, will not throw any definite light on this important point. On the contrary, we find estimates rise and fall, swell or diminish, according to circumstances. At one time so much money is wanted for certain purposes, and we find an estimate at one rate, at another time something altogether different. The value, therefore, of the minute and careful detail of cost, as well as of engineering construction with which Mr. Clark has supplied us as to the great Alpine tunnels, is evident, and the work possesses extreme value for the practical man.

The range of cost in tunnelling is very wide. There is, indeed, a difficulty as to the unit of comparison to be employed. The price is usually quoted at per yard lineal, and this, no doubt, is for short purposes the best guide. But the area of the tunnel has to be taken into account in making such a comparison. Thus the price of the tunnel for the Loch Katrine Waterworks at Glasgow is quoted exceptionally low, being only, where made through the clay slate, between 9*l.* and 10*l.* per yard. But, then, this tunnel was only 8 ft. in height, and the same in width, giving a sectional area of some 6 square yards. The tunnel section used on the South Wales Railway, on the other hand, was 28 ft. wide, and 21 ft. 6 in. from the surface of the rails to the crown of the soffit of the arch; and the Thames Tunnel masonry filled a rectangular section 38 ft. wide and 22 ft. high. Thirty pounds a yard is a price at which several tunnels of the ordinary dimensions common on the 4 ft. 8½ in. gauge lines have been constructed. This was the price of the London and South-Western tunnels at Guildford and at Salisbury, through chalk, and of the Lydgate tunnel on the London and North-Western, through the coal measures. Through dry sand the price has been higher, as although the excavation is somewhat easier than in chalk, more timbering and greater care in polling are required. The price of a tunnel through sand on the London and South-Western Railway, at St. Catherine's, was 40*l.* per yard; but dry sand is one thing and wet sand another. In the latter it is hard to anticipate the cost. The Saltwood Tunnel, on the South-Eastern Railway, is through wet sand. It cost 118*l.* per yard. In the Kilsby tunnel, on the London and Birmingham Railway, a quicksand, which had not been discovered by the trial-shafts, was encountered. The cost, delay, and discouragement were so great that the directors of the railway debated as to the abandonment of that part of the line. The ultimate cost was 125*l.* per yard over the whole 2,398 yards of the length of the tunnel. This was the largest cost incurred on any English tunnel, with the one remarkable exception of that under the Thames, which cost no less than 1,137*l.* per yard for its 400 yards of length. Even the Metropolitan Railway, according to the last Board of Trade returns, only averages 117 33*l.* per yard linear of line and works complete. The cost of the tunnel through the Alps, at the St. Gothard Pass, has, up to this time, been very close upon that of the Saltwood tunnel, being returned at 116*l.* 9*s.* per yard; but this work is only in course of execution. The cost of the Mont Cenis tunnel, 7·60 miles in length, has been 167*l.* 12*s.* per yard run.

The Mont Cenis tunnel is remarkable as being the spot where the use of excavating machinery was first attempted. Water power is available at each end of this tunnel, and it has been adapted to the compression of air, by which at the same time the machinery for drilling the well was driven, and the works were ventilated during progress. The tunnel was commenced in 1857, at both ends, by ordinary hand-mining. This was continued for three years, during which the pneumatic machinery was in course of construction. In 1861 machine-boring replaced hand-labour at the south, or Italian, end, and in 1862 it was introduced at the north end. A heading, or advanced gallery, 10 ft. square, was first pierced, eleven air-drills, or pneumatic perforating machines, being employed for the purpose at the north end, and nine at the south end. After several experiments as to the best size for the heading, it was finally settled at 9 ft. 6 in. in width, by 8 ft. 6 in. in height, for which seven perforators were employed. This gallery was, for a considerable period, enlarged to the full size of the tunnel by hand-labour. But in 1868 perforators were applied to the whole of the work, at a considerable gain in point of speed, although, contrary to our usual experience in substituting mechanical power for human labour, at a greatly increased cost as compared with hand-labour.

Nearly eighty holes were ordinarily made by the air-drills in the forehead or face of the heading. These were charged with dynamite, and successively fired, until the whole section of the headway was blown out or loosened. Two lines of railway were laid, one for removing the material loosened by blasting, which was filled by hand into trucks, and the other to carry the perforating machines. The rock was removed in these small trucks to the end of the advanced gallery, which was carried some 300 yards before the face of the main trains, and then tipped into large wagons, which were drawn by horses to the mouth of the tunnel.

The work subsequent to the piercing of the headway was carried on in successive stages The gallery was, in the second place, enlarged to a section of 12 ft. square by the use of five additional perforators. It was then enlarged to the height of 18 ft. by the use of two more of these machines, and a conduit for drainage was formed in the floor. The upper part of the tunnel was then enlarged to its full size by manual labour. It was then arched or lined with masonry. Finally, the lower part of the section was completed. Very little water was met with in the progress of the work, and timbering was not required.

As to rate of progress the heading at the north end, from the end of 1857 to the end of 1862, was driven by three sets of twelve miners, each working for eight hours, and the rate of advance attained averaged 1·65 ft. per day. At the south end three shifts of twenty miners were employed, and their advance averaged 2·148 ft. per day. The rate of progress was considerably less than that which we have ourselves attained, in Ireland, through wet rock, under extremely disadvantageous circumstances. But the superiority of the English miners is, or, at least, was in 1857, a point which both French and Italian engineers were quite ready to admit.

On the first introduction of the perforating apparatus the rate of progress materially slackened, owing to breakages in the machinery. Only 170 mètres were executed in 1861; but, as experience was acquired and defects remedied, more progress was made year after year. In 1863 the advance was 802 mètres; in 1864 it was 1,087 mètres; in 1870 it attained the respectable figure of 1,635 mètres. On December 25, 1870, at 4·25 p.m., a machine perforator working on the Italian side knocked a bore-hole through the diaphragm of rock then separating the advanced galleries, leading from France and from Italy. A number of bore-holes were then made in the curtain of rock, and having been fired on the 26th of December, 1870, at 5·20 p.m., the advanced galleries were brought into communication. The engineers had for some time been anxious lest the headings should have missed one another, as the estimated length of the tunnel had been pierced. It turned out, however, that the actual length, measured in the tunnel itself, was 11¼ mètres more than the length arrived at from survey and measurement over the mountain. Only 1 ft. error in level was found on the meeting of the galleries, and no appreciable error in direction. This was a severe test of the accuracy of the work, and the result deserves to be commemorated.

On the whole better progress was made on the Italian than on the French side, owing in part to the more favourable nature of the rock, and in part to the adoption of a smaller section for the advanced gallery. An advance from a mean rate of 4·01 ft. per day, taking both ends together, to that of 14·9 ft. per day, shows the great progress made in the command of machinery. But the cost of the latter was excessive. The apparatus employed consisted of two divisions. On the surface, at either end of the tunnel, was fixed the machinery for compressing atmospheric air, and for forcing it to the face of the work. Water was the motive power employed. At the south end a head of 85 ft. was available, and eleven hydraulic rams were fixed, which compressed the air to five atmospheres above the ordinary pressure, in a wrought-iron cylinder of 5 ft. in diameter. It appears that about one horse-power per cubic foot of air compressed was exerted per minute. At the north end there was an abundant supply of water, but a fall of only 20 ft. Rams were at first employed, but horizontal air-pumps, worked direct from water-wheels, by means of cranks on the shaft, were afterwards substituted with advantage. The leakage and loss of pressure were found to be inconsiderable. Cast-iron 7-in. pipes, with caoutchouc fittings, were used to convey the compressed air to the perforators. The pressure at the face, where eight perforators were at work, expending 64 cubic feet of air per minute, was equal to 96¾ per cent. of the original pressure at the mouth of the tunnel. The perforators were constructed with percussion cylinders, fed with compressed air, each of which gave both a blow and a rotary motion to a drill. A jet of water was sent into the hole to wash out the broken rock, as the boring proceeded. It proved to be necessary to have a stock of four times the number of perforators that were at work at any moment, repairs being so constantly required that only 25 per cent. of the number could be kept at the same time in working order. A set of forty-four machinists worked for six or eight hours. They were succeeded by a set of nine chargers; and these, in their turn, after the explosion, by thirty clearers. A second set of machinists then came on, and were followed by the same chargers and clearers who had worked before. Thus the total number of men in a day in the advanced gallery was 127. During the latest stage of the work, upwards of 4,000 persons were employed directly on the tunnel.

The cost of the heading, when executed by hand-labour, averaged 8*l.* 5*s.* 2*d.* per lineal yard; as executed by machinery, the cost was 26*l.* 11*s.* 1*d.* per lineal yard. Thus, by the employment of machinery, the rate of progress was more than doubled, and the cost per yard was more than tripled.

With regard to the cost per mile of the completed tunnel the amounts somewhat vary. It was finally let to MM. Sommeiller & Gratfoni, at a price equal to the sum before cited, of 167*l.* 12*s.* per lineal yard. In 1863 the cost was reckoned at 125*l.* per yard, and in 1870 at 120*l.* But the actual cost of the whole tunnel is said to have amounted to 3,000,000*l.*, which is equivalent to 224*l.* per yard.

The experience of the action of the perforators in the Mont Cenis tunnel is likely to be of advantage to the undertakers of the tunnel under the St. Gothard. But large quantities of water have been met with in the latter. It is true that the evil effects of water in tunnelling are comparatively slight when the work is entered by an adit, or open gallery, which allows the water to flow out by gravity, instead of being pumped up a shaft. In a moderately wet tunnel the cost of excavation may be reduced to one-half or less by the opening of an outflow. But with increasing length from the face expense and inconvenience always increase. It will not be before the completion of the St. Gothard tunnel that it will be safe to count its cost.

THE POSITION OF ARCHITECTURE.*

Let us now extend our vision a little further, and take a general survey of the state of architecture over the civilised portion of the world. During the last half-century an enormous change has taken place. The mighty power of steam, whether applied to manufacture or to locomotion by sea and land, has broken up the old lines and established new channels of thought and progress: no arts have felt the change more than engineering and architecture. In the seats of ancient civilisation, whether at home or abroad, the old towns have been renovated and rebuilt. Paris, usually considered the centre of the arts of civilised life, is the most eminent example. Under the auspices of the late Emperor and his henchman, Baron Haussmann, the city over nine-tenths of its area has been rebuilt; districts of squalid, tortuous alleys, the abodes of fever and the hotbeds of insurrection, have been replaced by stately arcaded avenues and boulevards lined with trees, faced with handsome stone-built mansions, hotels, and public buildings. Never in the history of architecture has there been such a transformation within so short a period. On the whole the effect is decidedly good. There is nothing in the way of street architecture equal to that of Paris, whilst the taste displayed in the vistas and intersections, and the open *places* where these occur, give a piquant charm not to be found, to the same extent at least, in any other city. Some of the public buildings and churches are of a very high class. The New Opera House, the culminating point of modern Paris, is doubtless open to criticism; but for lavish expenditure and grandeur of interior effect it will be hard to find its equal. The impulse thus given to Paris has spread over the whole country. Quiet Mediæval towns, which had slumbered on for countless ages in picturesque stagnation, suddenly awoke with a burning thirst for improvement and progress. Not only the great cities, such as Marseilles, Lyons, and Bordeaux, but Rouen and Rheims, and Orleans, and their sister towns in countless numbers, even to such a relic of the olden time as Avignon, have been rooting up their Mediæval features, destroying their old buildings, and converting their streets into a *réchauffé* of modern Paris.

The spirit of progress in architecture has not been confined to France. All over Europe, in every town of importance, the same revival has taken place. Vienna has built a new town over the ancient ramparts between the old city and the suburbs, and adorned it with many noble buildings and works of art, amongst which may be mentioned the New Opera House and the Votiv Kirche, structures fit to take rank with the noblest works of modern times. Italy, the home of architecture and art, is pressing on in the same direction. Milan possesses a unique feature in the magnificent Galeria Vittorio Emanuele, connecting the two principal squares, the Piazza della Scala and the Piazza del Duomo, erected within the last few years. Genoa and Florence are following in the same track; and Rome, the Eternal City, as she is called, has taken a fresh start, and is vigorously pursuing a course of improvement, which has already enhanced the value of property to an almost fabulous extent.

Our own country, as you all know, has not been behind in the race. Here our progress has been further stimulated by the sanitary movement, which has led to very important consequences, never originally contemplated. The metropolis, as was natural, took the lead, and is still working energetically, opening out new streets, pulling down objectionable quarters, and re-arranging them with an eye both to health and beauty. Amongst these metropolitan improvements two are worthy of special mention—the Holborn Viaduct and the Thames Embankment,—which structures are each in their several way amongst the finest of modern times. Others of our great towns have kept abreast of the movement. Glasgow is engaged in a noble scheme for the reconstruction of the lowest portion of the city, and Birmingham is about to spend two millions sterling in rendering the town worthy of its high position in the country.

In Liverpool we have not been altogether idle. Streets have been widened, new avenues opened up, and parks for the people constructed round the edge of the suburban district. Looking over the country generally, the spirit of improvement is manifest everywhere. The wealth of the nation has prodigiously increased of late years, and has been liberally expended in the direction of architecture. This is seen in the increased attention to design, and in the quality of the materials employed. The vile covering of compo, which half a century ago was all the rage, and was a mask for the most wretched material and work, has almost entirely disappeared, and is replaced by honest brickwork and ornamental stone facings. The architect has wider scope for the display of ability, and more is expected from him. The houses of our gentry and merchants at the present day display an amount of comfort and elegance which a century ago were never dreamt of, even in houses of much higher pretension.

Let me glance for a moment at several classes of the most prominent structures which the architect is now called upon to design. To begin with churches and chapels. There has of late been quite a rage for church building. Private benevolence has extended itself in that direction, and very large sums are continually laid out in places of worship for all denominations. On the whole, great progress is visible, and nowhere more than in our own neighbourhood. If I might, without being invidious, point out a recent specimen, I would allude to the church at Mossley Hill, designed by Mr. Paley, which carries out both externally and internally the true spirit of the old masters. The Nonconformists have partaken in the onward movement, and churches have arisen in our neighbourhood of late years which would astonish by their style and pretence the Baxters and Bunyans of old. Town-halls have of late been a favourite channel of municipal expenditure, and some very fine buildings of this character have been erected,—amongst others those of Hull, Halifax, Bradford, Rochdale, culminating in the magnificent structure at Manchester, costing nearly a million sterling. The majority of these are in a Mediæval style, to some extent founded on the model of the Belgian Hôtels de Ville. Some, however, have adhered to the Italian model, and it would be difficult to find any municipal buildings in the country surpassing in dignity and beauty the Town-hall, Liverpool, and St. George's Hall.

Cemeteries have in all parts of the country called forth the competitive spirit of our architects, and there are many, which for the combination of beauty of site with the pleasing effect of the architecture, are worthy of all commendation. These, so far as I am aware, have all been designed in the Gothic style, which lends itself by its solemn associations much more readily to such purposes than any modification of the Classical.

The People's Park has become an institution in most of our large towns, and has done much to neutralise the squalidity of our lower quarters, and to brighten the life monotony of our industrial classes. Architecture, to a certain extent, has lent its aid in their embellishment.

In Liverpool, commercial buildings on a large scale have become a prominent feature. Insurance offices, banks and piles of mercantile buildings, occupy the best situations in our leading streets, and take the place with us of the palazzi in Rome, Florence, and Genoa. The exigencies of commerce require a peculiar treatment. Light, which in Italy is rather something to be avoided, with us is the most essential element. Whatever our buildings may thus lose in dignity and grandeur, they may gain in cheerfulness and brightness of aspect.

The introduction of the suburban park has naturally led to a superior class of suburban dwellings. We find this the case everywhere. In our own town a fringe of noble mansions is gradually surrounding Sefton Park. The styles adopted are fairly open to criticism, but in the amenities and elegances of life they will be found quite equal to the demands of modern luxury.

Shop and street architecture has hardly made the same advance as the departments I have alluded to, but there are even here signs of improvement which are full of promise. The new streets in the City of London have many façades of great beauty, and the street architecture of the West End, where stone and brick have replaced cement, exhibit a wonderful advance over the fashionable squares of half a century ago.

There is one department of modern art to which I desire to make special allusion,—I mean the architecture of engineering. In the olden time the architect and engineer were one and the same person. Leonardo da Vinci, Michelangelo, and Albert Dürer were painters, architects, and engineers. In modern times, however, a separation has taken place. The architect is confined to buildings properly so called, and to the engineer is confided the execution of works supplying the public wants where durability and strength are required. In these respects our modern engineering is unsurpassed. The old Romans, with all their constructive power, and it was vast, never executed any works equalling the docks of Liverpool, or the London and North-Western Railway. It is much to be regretted that æsthetically there should exist almost universally such an utter want of taste in carrying out our engineering works. In many cases where a very slight or probably no additional expense would have crowned a noble work with the finishing grace of beauty, the opportunity has been neglected or even ostentatiously rejected. Could anything, for instance, be more utterly hideous than the railway bridge erected by Brunel over the Wye at Chepstow? Look at the Albert Dock warehouses at Liverpool, consisting of a noble mass of building fronting the river with breaks and projections, only requiring the hand of genius with a few graceful touches to stamp it with the character of dignified beauty. It is now merely a huge mass of deformity. I may also refer to the railway bridges over the Thames, leading to the Cannon-street and Charing-cross Stations. The bridges in every great city spanning a river are a great source of picturesque beauty. The graceful curves of the arches, the proportions of the piers, the opportunity for tasteful ornament, have rendered them a favourite study with architects in all ages. Paris and Florence are justly proud of the effects produced by their numerous bridges, and London Bridge, Waterloo, and Blackfriars have always been considered as adding materially to the beauty of the metropolis. The railway bridges over the Thames, which I have mentioned above, are about the most conspicuous examples of ugliness and pretence to be found in the country. Turn your eyes again to the two bridges over the Menai Straits. Thomas Telford was an architect before he was an engineer, and had executed buildings in which considerable taste was displayed. His Bangor Suspension Bridge is a model of lightness and beauty, of strength and grace. Compare that with the Britannia Railway Bridge, its neighbour, where the highest engineering talent, combined with unlimited outlay, could devise nothing better than a square hollow beam. I must, however, in justice mention a more recent work nearer home—the Railway Bridge at Runcorn—which has to a considerable extent redeemed the charge of want of taste made above. The lattice, which is the only true principle for structures of this kind, has been very skilfully applied with very good results. There are few things finer of its kind than a distant view of this bridge, with the graceful sweep of its arcaded approaches on each side.

There is one recent engineering work which may be mentioned in terms of unqualified praise; I mean the Thames Embankment. It is a work worthy of the metropolis of a great empire. It has converted into a source of beauty and utility a site which was previously a by-word for deformity and wretchedness. The grandeur of the design, and the magnificent way in which it has been carried out, are worthy of all commendation.

There is one department of engineering which affords abundant scope for beauty and design, viz., the Railway Stations. In some of these—*par excellence* the Midland Station at King's-cross—the aid of the architect proper has been called in, but the vast majority have been left to the same hands which designed the retaining walls and set out the embankments. The result in most cases has been grievous disappointment that so fine an opportunity for artistic display has been lost. At the same time many of the roofs over the stations possess the elements both of grandeur and beauty, from the vastness of the span and the scientific mode of their construction. Amongst the most noteworthy stand out the roof over the Midland Station above alluded to, and the more recent construction in Lime-street, Liverpool.

The revival of Mediæval architecture naturally led to a closer study of our old buildings, particularly the ecclesiastical ones, which were suddenly discovered to be in a state of decay, discreditable not only to those who had the charge of them, but to the nation at large. This having been seriously enforced on the public, an enthusiastic feeling set in towards their restora-

* By Mr. J. A. Picton. See p. 1066, *ante*.

tion; and the work has been carried on most zealously for a number of years. The amount of funds raised for this purpose by the liberality of the public is a marvellous sign of modern times. This result has been one of a very mingled character. In one point of view, the idea of restoring a cathedral to the appearance it presented in its palmy days, when it was turned out fresh from the hands of the freemasons of old, is one to be commended, but in other aspects it cannot be looked upon without a sigh of regret. A great part of the charm of ancient buildings consists in the association of ideas, in the feeling that we are gazing on the very stones which were put in their places in the days of the Plantagenet or the Norman kings. We feel identified with the ages past and gone when we look up at the glorious roof of Westminster-hall, and reflect what chequered scenes of English history have been enacted under its shadow. But scrape the rust of antiquity from the stones, replace the woodwork by an exact *fac-simile*, and the charm is fled. The flavour is gone; we are gazing on a substitute instead of the original, the link of connexion is broken and can never be replaced.

I am quite aware that in many cases this is inevitable. Where the substance is so far gone as to be incapable of repair, it must of course be renewed; sentiment must not be allowed to stand in the way of urgent necessity. But where it is at all practicable, I would plead for tenderness with the old work. Let it be replaced stone by stone. Let the venerable rust be disturbed as little as possible, that we may feel that we are united with our gallant sires of old, not only by sympathetic historical associations, but by a tangible chain uniting us link by link with all that is great and picturesque in the past. Who would wish to scrape the interior of Westminster Abbey or of Henry VII.'s Chapel?

> "If such there be go mark him well,
> For him no minstrel raptures swell."

The highest position would not preserve him from the execration of every one with the soul of patriotism within him.

This spirit of renovation is not confined to our own country: it rages with even a more thorough fanaticism in France and Germany. Time was when the city of Cologne, with its host of venerable churches, seemed like a section of the Middle Ages drifted down to our own times. Visit it now. The moss-covered façades, with their mildew of ages, are scraped and chiselled out of all connexion with the past. The brickwork looks as if it had just been turned out of the contractor's hands. We turn away with a sorrowful feeling, something like that expressed in the old Scottish song:—

> "O, this is no my ain house,
> I ken by the biggin o't;
> For boro-kail thrave at my door-cheek,
> And thristles on the riggin o't."

Closely akin to this question of restorations, is the propensity for the polychromatic decoration of old buildings. On the Continent this unfortunate propensity has had the effect of obliterating, or at least of concealing from view, the most characteristic features of some of the most interesting relics of antiquity. In England the principal object to which the advocates of polychromism have directed their attention is the decoration of the interior of St. Paul's Cathedral. Several gorgeous designs have been produced, but they have made very slow advances towards securing public opinion. A very rich and glowing effect may no doubt result from lining the building with coloured marbles, mosaics, and gilding, but it would no longer be the St. Paul's of Sir Christopher Wren. The effect of the design was intended to be brought out by harmony of proportion, beauty of form, due play of light and shade, and a moderate amount of sculptural decoration. Three of these elements would be entirely ignored by the introduction of the style proposed. Where richness of material and glow of colour are the main sources relied on, mouldings and sculptured features are altogether out of place. Flat surfaces as a ground for the ornamental material are all that is required. Thus at Ravenna, where mosaic is so profusely introduced, at St. Mark's, Venice, and at San Paolo without the walls at Rome, the costliness of the material dispenses with elaborate architectural details.

The nature of the material should have some reference to the locality in which it is to be displayed, particularly in exterior decoration. Works of art in marble, and richness obtained by colour and gilding, in the dry atmosphere and cloudless skies of Italy and the South, may keep their brilliancy for ages, whilst when exposed to the murky atmosphere of London or Liverpool, charged with humidity and soot, a very short time is required to destroy their beauty and precipitate their decay. It is grievous to see many beautiful and costly monuments in our cemeteries, of a date comparatively recent, with their surfaces corroded, their sculptures dropping to pieces, and their inscriptions obliterated. Gilding, colour, and metallic decoration fare little better. Iron will rust, gold will tarnish, colour is soon begrimed with soot. The introduction of polished granite, whether grey or red, has been a great boon for monumental purposes, combining colour, beauty of surface, and durability. It is somewhat surprising, considering the vast advances which have been made of late years in the art of pottery, that terra-cotta has not been more freely introduced for architectural and monumental purposes. In Italy, in the sixteenth century, it was freely employed with excellent effect, as may be seen by the examples at the Certosa near Pavia, the Ospedale Maggiore at Milan, at Bologna, and other places. Perhaps the most beautiful specimens of the kind are the friezes or panels on the façade of the Hospital at Pistoja, by Lucca della Robbia, which combine beauty of form, colour, and durability, to an extent unapproachable by any other material.

The literature of our art would require a treatise to itself. I need not refer to the standard works, such as Vitruvius, Palladio, Leoni, Chambers, Stuart, Britton, Pugin, &c., which are familiar to every student. Architectural literature in more modern times has not been found wanting. At the head of recent writers we must undoubtedly place M. Viollet le Duc, whose multifarious works, commencing with the "Dictionnaire Raisonné d'Architecture," down to his most recent volume, "Histoire de l'Habitation humaine," are replete with the most valuable information, and illustrated with a profusion and correctness not previously found. The magnificent work on Rome, by Francis Wey, though not entirely architectural, may be consulted with advantage for its beautiful illustrations.

In Germany, the "Geschichte der Architektur," by Lübke, gives a comprehensive view of the art, and is particularly valuable for its illustrations of German buildings.

In England, Mr. Fergusson's works are too well known to require more than a passing reference. His most recent volume on the Architecture of India supplies a missing link in the history of the art. The numerous works of Mr. Edmund Sharpe have afforded most valuable aid to the students of Gothic architecture in its practical application. Nor is it likely that the supply of architectural works will diminish. The facilities for illustration are now so numerous, with the aid of photography, lithography, and improved methods of engraving both on wood and metal, that scarcely an architectural example of the slightest value will long remain without illustration. In this slight survey of the literature of architecture, it would be unpardonable not to make honourable mention of the periodicals. The *Builder* has pursued its useful course for about thirty-four years, and has disseminated an amount of information quite incalculable. The *Building News* is remarkable for the profusion of its illustrations. The *British Architect and Northern Engineer* is pursuing a useful course in our own neighbourhood. In France the *Revue Générale d'Architecture*, edited by M. César Daly, and in Germany the *Architektonisches Skizzenbuch*, will keep the reader *au courant* with the most recent designs and erections. I am not acquainted with any American periodical devoted to architecture, but I perceive in the report of the recent National Convention of the American Institute of Architects, in November last, that a weekly architectural journal was announced to commence on the 1st of January in the present year. The interchange of these various publications from country to country cannot but exercise a beneficial influence in the interests of the art.

In taking a general bird's-eye view of the state of architecture in the civilised portion of the globe, we find great divergencies. Each nation has its own peculiar tendencies and idiosyncrasies. It would be almost impossible to mistake a German for a French building, or either of these for an English one. Much of this arises from the different habits of the people, and this again is dependent to a considerable extent on climate. In Italy the buildings are arranged to keep out heat; in Russia and the northern parts of Europe the object is to keep out cold. The *motif*, therefore, the principle of design in each case, starts from a different centre, and has widely different aims. So, again, in church building. Protestant Prussia models her churches on an entirely different principle from Catholic Austria. The orthodox Greek ritual imposes on Russian churches a mode of arrangement entirely different from both. France and Italy, of course, preserve in their church building the original basilica form. England is the only Protestant country which adopts the Mediæval Catholic arrangement for its churches.

Again, in domestic architecture, the tendency of the people to live in self-contained houses, on the one hand, or in the flats and apartments of a large mansion, on the other, has very marked and important influence on the style of building and the appearance of the towns. The stately streets of Paris, with their six and seven storied *maisons*, each with its *porte cochère* and inner quadrangle, contrast very favourably with the interminable ranges of three-storied houses in London. The second-rate towns in France and Germany present a still more striking contrast with the country towns of England in the loftiness and scale of their habitations.

Climate also, as affecting social habits, exercises a powerful influence on the laying out of towns. Where the people can enjoy out-door life for nine months in the year for the most part in bright sunshine, the arrangements must necessarily vary from those in a country where fog, and rain, and mist, are the normal condition. The blooming gardens interspersed amongst the houses, the trees lining the streets and quays, the parterres of flowers in every open space, which distinguish Italy and the south of France, would be an anomaly in Scotland or Sweden.

Another cause of diversity in architectural displays is the great difference of material found in different countries and districts. The centre of France, and the province of Normandy, possess freestone of the finest quality in the oolite formation, and their architecture has profited by the boon, in the refinement and beauty of their cathedrals and public buildings, and in the care bestowed on their private mansions. Brittany and the north-west of France is almost entirely a granite district, the result of which is found in the massiveness of the architecture, and its plainness even to sombreness. Compare again the brick architecture of Flanders and Holland, much of which combines richness and beauty, with the timber buildings of Switzerland or Norway; or the dull brick buildings of most of the English towns, with the stone ashlar fronts of Edinburgh or Glasgow, and it will be seen that the nature of the materials at hand exercises a most important influence on the nature of design and construction.

To a great extent the modern facilities of carriage have neutralised advantages and disadvantages of this kind, whilst invention is ever at work to furnish new materials and increased opportunities for the architect. The vast improvements in the manufacture of iron and glass have furnished the means of combining lightness and strength to an extent previously unknown. This has already manifested itself in the variety of Crystal Palaces already erected, and is destined to effect ere long still greater changes in the art of building.

To what should all this lead? The architecture of a people is the expression of its life and thought. The character of a nation is stamped upon its buildings. In the Egyptian, the Assyrian, the Greek, and Roman structure, we find indelibly fixed the despotic gloom of the first, the gorgeous state of the second, the elegance and grace of the third, and the iron will and power of the last. Equally so the power of the Church and the warlike habits of the Middle Ages are unmistakeably impressed upon their architecture. What character will the buildings of the present age hand down to those that come after us? One stamp will undoubtedly be that of utility. The great majority of modern buildings of any importance are for the many rather than the few. Our railways, churches, markets, exchanges, town-halls, libraries, baths, are for the people at large. Another character is that of comfort. The standard of life is higher than at any former period, and all classes require attention to details which would have been utterly ignored a century ago. With regard to mansions of any pretence, it may be added that another characteristic is that of luxury. By this I mean something beyond either comfort or amenity,—billiard-rooms, conservatories, marble halls, polychromic decoration, &c. I see nothing to condemn in this. It

stimulates invention and design, and taxes the genius of our architects to the utmost.

At the opposite end of the scale the provision for healthy and commodious dwellings for the working class, at a rent within their means, becomes an increasingly difficult problem year by year, from the additional cost of land, labour, and materials. Efforts are constantly being made in this direction with a certain degree of success, and the impulse thus given must ultimately lead to a solution of the problem.

Architecture is history in stone and brick; and you, gentlemen, in your ordinary occupation are constantly engaged in writing that history. It ought to be a noble one based on truth and honesty, and aspiring after the useful, the beautiful, and the good. In aiming at these ends personal aggrandisement may not always be the reward. The race is not always to the swift, nor the battle to the strong, nor, I may add, do the prizes uniformly fall to the lot of unpatronised merit; but I have great faith in perseverance and determination; and even if fortune should not ultimately crown your efforts, you will have had the satisfaction of adding to the conveniences and comforts of life, of producing some thing of beauty which may be a joy for ever. Who would not rather be a Sir Christopher Wren, with all his vexations disappointments and the base ingratitude with which he was treated, than have been the richest millionaire who ever lived?

Let the ideal of your art and calling be a high one,—too high to stoop to shifts, meannesses, or jealousies; sympathise with each other in your difficulties and trials; lend a helping hand to a brother in distress; be always ready to encourage the young seeking for advice and information; hold out the right hand of fellowship to all who are travelling in the same path, and in so doing you will find that union constitutes strength, you will magnify your office, and help to raise your profession to its right position, inferior to none of those which minister to the highest needs of mankind.

A PLEA FOR THE FUTURE PROTECTION OF OUR ANCIENT CATHEDRALS.*

In conveying to me the request of the Council that I should read a paper before the Society this session, the hon. secretary remarked that it was thought in the meeting I might have something to say about Chester Cathedral. What I now bring before you is not about Chester Cathedral, for I had already said enough on that subject, and more than was pleasant to me to say. But it has arisen out of views and feelings to which the recent "restoration" of that structure gave rise; and which I expressed at the time in letters of some length to the *Athenæum* and *Builder* and to the Liverpool and Chester newspapers. I trust it will not be attributed to a censoriousness of spirit or love of contention on my part. I have no abstract liking, I assure you, for the subject; I would much rather be discussing some other and more exclusively architectural topic,—one more connected with the principles and essence of architecture. But I have a strong persuasion of the magnitude of the evil I am seeking to expose, that whatever is done to expose it should be done at once, and that if I do not do it nobody else will.

If this paper contain matter offensive to individuals or classes of individuals, I beg you to recollect that it is in the nature of the subject it should do so. My older friends present can bear me testimony that, however I may in times past have dealt in disagreeable truths, I have never indulged in personal abuse, and that my censure has been confined to what I deem false principles or mischievous practices without reflecting on individuals. I have pursued the same line of conduct in this paper, and have the consolation of believing that if the views expressed therein were acted upon, it would be the best in the long run for all parties concerned.

Architecture, for obvious reasons, has suffered more in her works from the various destroying agents, natural and artificial, that are abroad on the earth, than any other of the fine arts. But there is one that has sprung into existence within the present generation, which, under pretence of calling back to ancient buildings their pristine perfection, commits greater havoc in two or three years than a combination of the former usually effect in a century; which is done by substituting for the old familiar face of a building submitted to the process, first cut away to a depth of 9 in. or 10 in. to receive it, an integument of new masonry, which may be observed gradually stealing over aisle and clearstory, gable and tower, till it engulphs the whole. This mask, as I have said, usurps the place of the original face of the building, which, with what remains of its once delicate contours, and various outlines, exquisite carvings, details and tintings, in which all artistic life, all grace, expression, poetry inheres, is hacked away. This is "church restoration," which is necessarily architectural destruction, or the letting out of artistic life,—a mode of treatment suited, perhaps, to utilitarian and engineering works, but surely fatal to those of a soul-born art. Its results on the ancient churches are the greatest losses which architecture has to mourn, at least within the United Kingdom.

This, it will be thought, is saying a good deal, and I may be reminded of the devastations of the Parliamentary armies in the Great Civil War. These I remember hearing reference to on first paying my respects to the cathedrals, and regretting that they could not have pulled down tyranny without pulling down architecture along with it, and that Oliver Cromwell had not added to his other great qualities some taste and reverence for the beautiful such as his victim Charles is known to have possessed; or that his Latin secretary, the poet of "Paradise Lost," a votary of the beautiful in another form, did not exert his influence with him to protect the great poems in stone. The injury done to these buildings during the Rebellion in England was very great, and that in Scotland at the Reformation by Knox and others was still greater. But is it not far less destructive architecturally and archæologically to knock down a portion of a building than to replace its live walls, breathing of ancient times and generations, with dead walls breathing of nothing, and afflict the whole as with a leprosy? Throw down a choir and the nave and transepts still live and exhibit their wonted beauty, as a mutilated man deprived of arms and legs may still maintain health and perform all the functions of life; but envelope the whole of the cathedral in new stone, and you not only do not restore, as is pretended, its formal beauty, for that is impossible, as impossible as to recall the bloom of youth to the cheek of the octogenarian, but you destroy all relics of that beauty, and all the beauty and interest that ages had conspired to bestow on it, and paralyse the whole. Nay, the remains of the demolished portion will, should one stone be left upon another, be more interesting than a "restored" structure. There is more of the original beauty still lingering in the ruined choir of St. John's, Chester, than in the entire exterior of the neighbouring cathedral, and its power of giving pleasure to the pure and refined taste is far greater than any restored cathedral can boast. If I refer to Chester Cathedral more frequently than to any other example it is simply because I am best acquainted with it.

"Restoration" seems to me the most anomalous practice ever introduced into the republic of art.* Its process, or way of working, is the reverse of that of art, which is analogous to that of nature. The architect from the inert quarry calls up, like the sun-bright butterfly from the worm, the glowing palace or minster. At the touch of a Phidias, the marble block leaps to life, a god; but "restoration," reversing this, turns architecture into masonry; and a cathedral, from a living and eloquent work of art, teeming with mementoes of the past, becomes a mountain of lifeless stone. If there be no irreverence in the comparison, it is the story of Lot's wife over again.

It has, in all ages and lands, been deemed a legitimate expression of piety to bestow all possible excellence upon houses built to the Deity; and, accordingly, temples, and mosques, and churches have been the fairest structures that could be reared, and show the art of their day and nation at its highest point. And if beauty be the signature and seal of God upon His works, a voice addressed to the immortal part of us from Him who is the fountain of all loveliness, it is surely a proper quality to give to His house. But here are temples that have fallen into the hands of the Church of England the original beauty of which a thousand cosmetic agencies and influences have enhanced, and which are crowded with historic memories and associations; and instead of carefully preserving them in this state, pious men, desirous of honouring God, through lack of taste and art-culture, go about to reduce them from this interesting state to one the most uninteresting that could well be conceived.

It is true the preservation of the interior of these buildings is more important in a utilitarian point of view than that of the exterior; and "restoration" might at first sight seem a worthy sacrifice of the latter to the former. But it should be remembered that it is the exterior of a building that has become related and assimilated to surrounding buildings and scenery, and received the beautifying action of Nature by which it is constantly renewing itself and disclosing fresh charms. It is the exterior that has kept record of the ages that have gone over it, and received the glow of an immortal interest from time; every passing year imparting to it richer and more eloquent expression. Time, of course, can and does act upon the interior; but there all signs of antiquity must of necessity, in the process of cleaning and decorating, be constantly disappearing, except, perhaps, in old carvings; and even these must lose evidence of age in being cleaned periodically. Interiors may have all the beauty that architecture, sculpture, and painting can give them, but they can have no more: time may add but little, and sun and rain nothing to their charms, which can bear no comparison to those of the exterior, all of which are entirely dispelled by the prosaic process of "restoration."

This has been the case, more or less, at Westminster Abbey, and at Chester, Canterbury, Lichfield, Ely, and other cathedrals, which are now, therefore, defunct, or only live in the works of the painter, such as those of David Roberts, Turner, Prout, S. Reed, and others; and in photographs and engravings, which the restoration mania has rendered of great value. Even the architectural illustrations of them by Britton, Winkle, and others, wherein they are in some sort immortalised, have an increased interest; and I, for one, could take more pleasure in examining those illustrations than in the restored cathedrals, which, indeed, give me pain rather than pleasure. They are now merely examples of Modern Gothic, and are not a whit more interesting generally than other specimens of that style.

I have already attributed this treatment of the cathedrals to a deficient appreciation of them on the part of their clerical custodians, who seem less capable of dealing with architecture, and less tender of its precious relics than might have been expected, considering the natural connexion of the beautiful with the good and the true, of which they are the high priests, and of which the former (the beautiful) is the complement. But if the power to receive ideas and sensations of beauty depend chiefly, as I believe it does, on purity of heart and justness of moral perception, it should at least not be wanting among the constituted and recognised spiritual guides of the people.

Another, and active cause, a love of architectural display, lies also, I fear, at the bottom of the evil, and this exhibits its working lower down in the church, where it is equally mischievous, and leads to waste of money and energy: while the spire, as it rises into the depth of the sky,—

"Star high, and pointing still to something higher,"—

is very properly looked upon as a symbol of Christian hope and aspiration; it is too often also the gratification of the desire of the eyes or the pride of life, or of piety with a considerable alloy of terrestrial yearning.

An instance of this that really deserves comment has lately occurred in the immediate neighbourhood of my abode, where a sum of money collected with difficulty from people not very well able to afford it, sufficient of itself to build a small place of worship, has been spent in enlarging a church that nobody had ever seen filled, and in metamorphosing it from the Anglo-Greek style of its day into the Ecclesiastical Gothic.

In this case, of course, no fault is to be found with the architect employed, who has solved the somewhat hard problem assigned him as well as it could be, which was not unlike turning an

* Read to the Architectural Society of Liverpool, November 1st.

* The Mediævalists pulled down and altered the work of their predecessors, just as it suited their purpose or whim; but they never did anything like restoration,—a practice now introduced for the first time in the history of art, which is no longer embodied in its remains. History in brick and stone—history as told by its monuments and ruins,—will not exist for the future archæologist, for restorations must destroy all faith in that medium or vehicle of historic record. So many buildings will be telling falsehoods that those will not be believed which may happen to be telling the truth.—S. H.

apple into an orange. But unless He who has promised to be present wherever two or three are gathered together in His name, and who is no respecter of persons, can be shown to be a respecter of architectural styles, this must be considered an entire waste of money.

The foregoing remarks apply chiefly, if not solely, to exteriors. I find no fault with what is generally done within, where there is great scope for improvement by removal of successive layers of whitewash, and the application of painting and gilding, as well as pictorial and sculptural embellishments, which are usually very much needed. Generally speaking, however, "restorations" are accompanied by re-arrangements, in which the changes are often too sweeping, and not always judicious. Screens and time-honoured monuments, around which associations and passions have crowded, are removed without sufficient cause or object. At Bebbington Church, in this neighbourhood, repaired or restored some years ago, I remember being pained at the sight of alterations for which there was no conceivable need, and which must have been made, not from the desire of improvement, but the mere lust of change.

As far as I know, or can learn, York Minster, and the cathedrals of Wells, Lincoln, Winchester, Peterborough, Durham, and a few others are for the most part uninjured. Let me respectfully suggest to the ecclesiastical authorities that these remain intact; and remind them that, whatever legal right they may have over these buildings, they have no moral right to alter or modify them against the wishes of the people, as they belong to the nation,—to the world; and not to the present generation only, but to posterity, to whom as to us they have been bequeathed by those who gave their strength and wealth and life to accomplish them,—"a legacy," to quote a well-known and eloquent writer whom I shall shortly have occasion to name, "of more than their hearts' blood, for it is their souls' travail."

This subject would come within the scope of any future Bill that Sir J. Lubbock may think fit to bring before Parliament for the "Preservation of Ancient Monuments."

I am frequently asked by architects and others who sympathise in my feelings towards "restorations," what would you do with these old places when they become dilapidated? My answer invariably is that nobody that had a due appreciation of their beauty and æsthetic value would ask the question. I repeat this here. Nobody that knows and feels how infinitely superior they are in their natural state to what they become under the hand of the "restorer" would hesitate a moment as to the propriety of continuing them by the best means possible in their present surpassingly romantic condition. I have known persons of the most undoubted artistic taste and feeling stand in rapt admiration of the beauty, original and acquired, of these edifices, and express themselves to the effect that there was nothing so beautiful elsewhere in England, or, perhaps, in the world. Now, the feeling which so appreciates this beauty is not an exceptional or questionable feeling. It is not a myth; but man's instinctive delight in the beautiful and the true; and a real element in human nature, the holiest, the divinest part of it; and the foundation in every artistic mind of such excellence in art as was achieved by men like Turner, Wilkie, Etty, Landseer, Mulready, who without the feeling which would so appreciate these edifices could not have been the men they were.

If this is a sentimentalism to which the spirit of the age is opposed, as some of my antagonists have insinuated, then the spirit of the age, to be consistent, must oppose itself to the whole of the fine arts—poetry, painting, sculpture, architecture, music,—for, and it follows from what I have said before, they are all built on and are exponents of it. It is the basis of everything that administers to our higher needs, including ethical or moral philosophy, and even religion itself, so far as it attracts by its moral beauty. But it is pleasant to think that in most other matters we have not come to this, and that Jeremy Bentham and Malthus, as apostles of utilitarianism, are not enthroned in the public heart and mind above Milton and Shakspeare. Nor is it irrelevant to observe that even the great demi-gods of science, such as Newton, Bacon, Davy, Watt, come in the second rank, and are still, in the estimation of all true appraisers of intellectual worth, below Homer, Dante, Raffaelle. Science is great, but art is greater—the first discovers, the latter creates; and that principle or fact has insensibly regulated throughout history the relative rank of men, or classes of men, and their works.

The peculiar beauty, therefore, of these edifices, however it may be slighted by the utilitarian or worldling,—all who would not repudiate the entire circle of the fine arts, and turn their backs on everything refining and elevating to the mind, must acknowledge. By it, and being half-embosomed in Nature, they enter into rivalry with rocks and trees, with hills and mountains, and the most beautiful features of the earth. In them there is more of poetry than any new building could possess. They feast the eye and the mind, and sometimes exhibit a pathos that thrills and moves the heart. In many of them every stone is literally a picture. I have seen stones with markings very similar to the design on a Paisley shawl, and quite equal to it in beauty, both for variety of form and colour. We may deplore the loss of mouldings and details, and if we had the Talisman by which we could recal that state of each building just before the mouldings and carvings became mutilated it would be well to use it. But as we have not, we may well be content; for Nature has given to it what is a richer adornment than mouldings, and a greater perfection than it has lost.

Even Classic buildings under the same benign influence become eminently picturesque. After the assaults and battery of 1,800 or 2,000 years the triumphal arches of Rome never looked so triumphal as they do now. Though much bruised and injured, and stripped of many an ornamental detail, the arch of Septimius Severus is one of the most glorious objects of the city, and the same, I doubt not, may be said of many other similar relics of the Classic time. But the buildings I am now pleading for add to many qualities of these a more picturesque style and form and are more extensive and varied in plan and outline. No other buildings in England, or anywhere, perhaps, except the Egyptian temples, present such complete and varied composition and design, or exhibit so fully the capabilities of architecture for poetic effects. Wander through one of our first-rate cathedrals, and you find it an epic poem or romance in stone, with its episodes of lady-chapel, chapter-house, and cloister; the latter, beneath the antique arches of which the spirit of past ages seems to linger, being for beauty perhaps equal to any court in the Alhambra, though essentially different from it. The pictures of Canaletto, Turner, David Roberts, Prout, Watteau, and others, prove the high appreciation of the greatest students and delineators of physical and picturesque beauty of such subjects.

While interesting and delightful to artists, and all people of taste, these buildings have a peculiar value for architects. In the infinite variety of minute markings and tracery, spread over their walls, which seem the ideal of mural decoration, and often presents a scene of romantic beauty, nature has given a detail and adornment of her own that was beyond human invention, and a lesson in mural ornamentation which, rightly read, might enable us to communicate to our works something of the power and pathos that these possess. Such power and pathos are possessed by mosques and tombs of the Saracens in Egypt and India from original design; and the secret of it lies doubtless in the greater fidelity of their architects to such teachings of nature as I have suggested. Among other lessons it shows how a building may be literally covered with rich decoration, without destroying the quality called breadth; a secret known to the architect of Henry VII.'s Chapel, Westminster Abbey; but possessed by few moderns, if we may judge by their works, among which we too often find an otherwise good design cut up by its coarse detail, and so failing utterly in unity of effect.

A friend showed me, a few days ago, an eloquent and powerful protest against "Restorations," in the "Seven Lamps of Architecture," which I had either not seen before or had entirely forgotten, feeling no interest, perhaps, in the subject at the time of reading that book. In this protest, in which the author has used stronger language than I have ventured on, characterising restoration as the most total destruction which a building can suffer,—a destruction out of which no remnants can be gathered, a destruction accompanied with a false description of the thing destroyed,—he pleads for the preservation of the cathedrals on the ground of there being yet in the old buildings *some* life, some mysterious suggestion of what they had been and of what they had lost; some sweetness in the gentle lines which sun and rain had wrought, while there can be none in the brute hardness of the new carving. I plead for them on this ground also; but more on the ground of what has been added to them by nature. I allude to the endless imagery woven by lichen and mosses, producing the most exquisite harmonies of colour, which, I think, more than compensates for what they have lost, and renders them more impressive than they were in their prime.

I would just remark here that another well-known writer, Mr. Edmund Sharpe, has also spoken out as to the destructiveness of restorations, at least archæologically, and that similar views to my own are held by Lord Sandon, as a note from his lordship in my possession will testify.

What renders the preservation of these buildings the more desirable is, that they are our oldest monuments. Most other countries of Europe contain structures more ancient still,—remains of Classic times; and Spain, Belgium, Germany, and even France, are not destitute of architectural mementoes of the power and grandeur of the Romans. In Spain are also remains of the Moors; while in Italy, temples and theatres, and early Christian basilicas, make the works of the Lombards look modern. In Greece and Turkey are yet older works,—Greek temples and remains of the Pelasgi; but in Great Britain, except a fragment or two of Roman work, Irish round towers, and some rude Druidical remains, we have nothing that goes further back than the times of the Normans and Saxons, the earliest constructors of the ecclesiastical architecture of Great Britain, and founders of most of the cathedrals. What is more, they usually form each of them the central and uniting feature of a larger picture—the old metropolitan city of the diocese, where, situated generally on the summit of a hill or highest ground of the place, and joined by an ancient castle or other relic of antiquity, it is seen for miles round, seated like a patriarch among his descendants, and touching it is disturbing the genius of the place, and affecting the identity of the city. Most of our old cathedral cities, as Canterbury, Wells, Chester, Chichester, York, Lincoln, Lichfield, Durham, Worcester, Coventry, Hereford, &c., situated in a beautiful country, appear to the susceptible traveller like the work of magicians. Compounded of elements of beauty, material and moral, the combined bequests of art and nature, time and history, chance and change, they form a whole far beyond the reach of art. The city of Chester, for instance, may be looked on as one vast museum of British antiquities, containing vestiges of every epoch of our history, every change in Church or State from Roman invasion downwards, like the successive strata in the crust of the earth—the deposits of so many pre-historic periods. Here have been history and legend, Roman castrametation, and Roman mythology, Christian monachism, feudalism, and chivalry, Catholicism and Protestantism, municipal and commercial institutions, and, I may add, happy English homes, interpolated on the fair face of nature, on "the divine sky and the immortal year," rendering the spot more interesting and impressive than any Eden or Temple of pure nature could possibly be. Even the shadow of the tomb, which is cast over everything, and is almost everywhere felt, enhances the effect. Such cities are the gray hairs of the land, and despoiling them by renewing their chief and characteristic features, the cathedrals, is modernizing and disfiguring the country, lessening its art-treasures, and falsifying its historic page. It weakens our attachment to fatherland, diminishes the pleasure of travelling in it, and renders it less attractive to our American and Australian kindred, as well as to foreigners.

The error of the Restoration scheme will be more apparent if we, adopting the logical method of argument, "*reductio ad absurdum*," suppose it universally carried out, which we clearly have a right to do; for if it is good for our ancient cathedral and abbey churches, it is good for all kinds of old buildings, for old palaces, old castles, old temples, which must be all more or less superficially decayed. Imagine it is so applied, and what are the consequences? It would render the Old World,—Europe, and Asia and Africa,—as young as America; Egypt would succumb to California; Cairo and Athens and Damascus to San Francisco and Chicago. It would modernise the most ancient and disenchant the most romantic spots on the globe. Florence, Venice, Genoa, what would they be-

come if restored? It would make Constantinople coeval with Llandudno. It would destroy the historic renown of the Eternal City itself, which in future might be the rival of Birkenhead or Southport. Nay, but for our old books and old pictures, and a few other old things, to which the genius of the past would have to confine herself, the very term antiquity would become abstract, or have no more significance than the words red and yellow to the blind; and the objects for which the science of archæology, and archæological and antiquarian societies were established, would vanish from men's minds.

"But," says the holder of what is deemed the practical view of the matter, "the cathedrals are going to pieces; they are wanted for use, and must be fitted for use." As this is a view well deserving of consideration, let me say a word thereon. I believe that none of the cathedrals are really so dilapidated as they appear; the more as I never heard of a cathedral going to pieces. Nor do I think that, with their very substantial walls, from 5 ft. to 6 ft. thick, and with buttresses 6 ft. or 7 ft. projection, they are at all likely to go to pieces. At Chester Cathedral, one of the most dilapidated, from its being of a perishable stone, I have the best authority for saying that the walls were so sound within a few inches of the surface that great difficulty was felt in bonding the new work. If the cathedrals were likely to come to pieces, would the hacking away of the surface, and further for the bonding, be likely to prevent them? And would it not be strange that, varying so much as they do in age and degree of strength, and other circumstances affecting power of endurance, they should all be coming to pieces just now in the latter half of the nineteenth century, and within a single lifetime?

As to being wanted for use, I believe they are really very useless things to their present possessor, the Church of England as by law established, being built by another church for a very different service,—one arising out of a more complex system of religion, which, among other differences, called for a plurality of simultaneous masses. The choir, termed also the sanctuary, was for what is called the Divine Office; and, containing the high altar (which was likewise placed in the crux, or under the tower), was used for pontifical high masses and other great solemnities. The lady-chapel was for low masses and minor feasts of our Lady; and the side chapels for low masses for the dead or living; while the nave aisles were left vacant for sacerdotal processions; and are all, therefore, useless and unmeaning in a Protestant cathedral, the present service of which is a compromise,—an adaptation of the religion, or form of devotion, to the building. Hence James I., when he first saw an Anglican cathedral service, remarked that it was like a mass badly said.

Such being the truth, my suggestion in former essays on this subject to supersede, in each case, the old building, as regards its practical use by the erection of a new transept or other block of building for the service, and keep the former intact as a relic of antiquity, must be deemed worthy of consideration as a rival scheme to restoration. As such new building would not be detached, but joined up to and made part of the cathedral, there would be no loss of association with the old place or foundation; while it could be made of the proportions, as to height and width, essential to comfort, and indemnity from colds and draughts, for a seated congregation, which the cathedrals, some of them approaching 100 ft. in height (York Minster being 92 ft. and Westminster Abbey 99 ft.), are not. Our cathedrals are worse in this respect than most of the Continental ones, especially the French, which, having fewer parts internally, are so far more suited to Protestanism than the English,—among which there is only one, that of Ely, which, from its having a large octagonal centre space, could by screens and fittings, be rendered tolerable. So disproportioned and unfitting are the rest, that the erection of such an addition as I have suggested would be an improvement, whether the old building was dilapidated or not. The latter I would preserve by the best means possible, holding it together, if needful, with iron rods, and shoring it up with iron struts, which would be less unsightly than wooden ones; and so aided, with roofs and gutters duly cared for, it would never come to pieces, but every year become more venerable and more pathetic in its appeal to the spectator of sensibility. I do not follow Mr. Ruskin in his anticipations of the evil day when it may be necessary to pull it down. I believe it need never be pulled down, though it would be infinitely better to do so than to "restore" it, as there would then be a chance of getting some original and meritorious design in its place; which was the result of the removal of Old St. Paul's, Old Somerset House, and Greenwich Palace, which gave place to three of the finest structures of modern times.

If I am right in what I have advanced in this paper, then the "restoration" of a cathedral is an enormous waste of money; for the new wing or transept, and the due repairs and preservation of the old building, would not cost more than half what is spent in restoring it; and a large sum is consequently expended mischievously that might have been applied to church-erection in spiritually-destitute districts, which are numerous everywhere, especially in London. Or, if you prefer a more tangible object, but which is closely allied with the former, to the replacing with comfortable abodes some of the "hovels," "rookeries," "human styes,"—as the dwellings of too many of the poor of the metropolis and the large provincial towns are variously termed,—as it would also have given relief to the distressed, and means of health to the afflicted.

It is painful to make this remark; but it is still more painful to think that, during the last quarter of a century, an amount of money has been expended in an operation of at least a questionable character upon the chief ornaments of the country,—which ancient buildings of the first class undoubtedly are,—which, judiciously spent, would have reduced the death-rate of England.

SAMUEL HUGGINS.

BYRON AT SOUTH KENSINGTON.

Hades: November.

DEAR SIR,—As I was snoozing t'other day
Upon a bed of "heap'd Eysian flowers"
(That phrase is Milton's, I confess, but pray
Excuse the licence), from his murky bowers
Old Pluto waddled up to where I lay:
Says he, "I've heard within the last two hours
They're making" (here he roused me with a shove)
"A precious fuss about you, up above.

"Although your priests and people were but shabby
In former days, refusing you the glory
Of snugly decomposing in the Abbey,
They wish to make amends now, less or more, I
From Hermes hear (and, though at lies a dab, he
Would scarcely venture to invent this story);
They've got a lot of models,—you can see 'em;
You'll find them in the—What-d'you-call't Museum."

I yawn'd, and stretch'd myself, and, thanking Pluto,
Concluded I would see the things, although
Deeming the honour tardy (so would you, too,
If you had been so many years below
Without a monument); and with a view to
My passage over Styx, to reach the show,
I saunter'd to the bank and hail'd old Charon,
And cross'd (the rascal clapp'd a double fare on),

And came up into London,—I don't mention
Precisely *where*, lest dull investigation
Should set on foot a charge of mere invention
On my part, and discredit this narration,—
Suffice it that, according to intention,
I reach'd the Art Museum of the Nation;
"A mighty mass of brick," but plann'd with what I call
A lack of due precision mathematical.

For, after turning right and left and right
Amid a maze of objects of *vertu*,
Statues and bas-reliefs and vases, quite
Bewildering, unless you have the clue
Which may enable you at last to light
Upon your object, after hunting through
A wilderness of glass-work and *bijouterie*
(Such as they can't make now, although a few try),

I got at last into a regular bother,
When a polite but very stolid officer,
Seeing I did not quite know what to do there,
Show'd me a corner from which leading off is a
Passage, on one side statues, and on t'other
A room for "chops and steaks, and tea and coffee, Sir!"
(And *other* places, too), and up a stair,
And through a gallery cramm'd with crockery-ware,

Which (being no *connoisseur*) I don't dilate on,
But stay'd to note some sketches by Maclise,
And paused where Spencer's beauties keep their state on
Reynolds' and Gainsborough's canvas, with the ease
And native dignity that seems to wait on
The lady of those days, whom on my knees
I could adore—when lo! a dirty curtain,
Which was drawn back, and there I was, for certain.

Gods! what a medley! figures of "ourself"
In two-or-three-and-forty different attitudes;
Some squatted on a temple, or a shelf
Of rock, some gazing upward in beatitudes
Of inspiration, as if spurning pelf
And publishers; but most were cursed platitudes,
And (which I think's a "matter" worth "inditing")
They nearly all held pens, but none were writing.

One was all gown and laurels, while a lion
Spasmodically claw'd a lyre beneath;
One show'd the "noble poet" placed on high on
A block, while two fair maids each held a wreath
At arm's length towards him, who turned ne'er an eye on
Their futile stretch the guerdon to bequeath—
Now, though I'd quit my pedestal for no man,
I never could resist a pretty woman,

Much less a couple (though perhaps embarrassing—
"Happy with either" were my judgment here);
But to pass on—although it's almost harassing,
The various looks and dress I'm made to wear—
A simpering dandy, or a swaggering Saracen,
A coat and breeches here, a toga there,
And boots of every sort, including Hessians,
(Things that I never wore, preferring easy 'uns);

One meditates on Marathon's past glory
In high heroics; two, seated, hold a volume
Blandly (they're more like Campbell and Tom Moore, I
Should say, than me); one leans upon a column,
(A thing that, in two senses, tells a *story*,)
Looking most preternaturally solemn,
Though graceful; but I'd better features than the
Sculptor shows; if you doubt it, ask Ianthe.

Here two girls hold one garland, but (which vexes
Me, and must puzzle readers of this true ditty)
They're *only half my size*; here, more complex, is
A group with angle figures, with some erudity,
But clever; the artist separates the sexes,
Wisely, *I* say, considering their nudity;
For, though I've no strict notions about *He's* and *She's*,
I always much approved of outward decencies.

(That last rhyme limps a little, I allow,
But you must recollect I'm out of practice,
For, to say truth, I find that here below
Composing verse a most unusual act is,
And then your English tongue's castrated so
By modern taste and habits, that the fact is
We're hamper'd quite with sentiment and sham,—
They'll scarce permit ye e'en a modest "D ——n.")

But where the devil was I? To digress
Is my old weakness: here is, on a pyramid
A figure reading; pretty, I confess,
But a preposterous pedestal to rear amid
The Green Park; here another, by his dress
A naval youngster, but as I was ne'er a "Mid"
In H. M. service, this is quite unsuitable,
Although the artist's talent's irrefutable.

One, made of substance something like plumbago,
Is evidently looking for a lark;
One has a devilish twist, as if lumbago
Afflicted him (though not below the mark
In all points); here is one that might some day go
For antique, with a Muse in classic sark,
Fed, I should say, on very solid *pabulum*
(The sculptor's name in Latin 's *Tintinnabulum*).

In some 't would utterly perplex the sagest eye
To trace my likeness: one resembles "Dizzy"
(Whose fame precedes him here), and, though a badjest, I
Allow, yet I can't help suggesting quizzi-
-cally, that one's like his Satanic Majesty;
And one's so like Napoleon, you'd say *'tis* he:
I think they've "caught some boobies and a noddy,
And given 'em *carte blanche* with my "dead body"

(That's in *Don Juan*—somewhere—I've forgotten);
In short, I must admit I fairly swore
(Shocking the visitors) at seeing what on
Some pedestals was placed: may I no more
Be mention'd, may my fame be dead and rotten,
And pious persons dub my Muse a ——,
Rather than *thus* be honour'd! I'll waste ire on
Such things no longer, though:

Yours ever,

BYRON.

A GOLDEN WEDDING AND A FUNERAL, IN PARIS.

MANY of our readers will remember as well as we do when, more than thirty years ago, Bouffé acted at the St. James's Theatre for the first time in England, and delighted all true artists with his exquisite delineation of the old man, who wanted but three weeks of a hundred, the Père Turlututu.

Last Thursday week, at Auteuil, in the quiet old church of that retired suburb, Bouffé celebrated his golden wedding, surrounded by his family of artists and loving friends, who, after the ceremony, returned to the charmingly embowered home of the artist, who proudly showed them the wedding certificate, notifying how on Thursday, November 9th, 1826, presented themselves at the *mairie* of Bercy, to celebrate there their marriage, Hugues-Marie-Désiré Bouffé, twenty-six years of age, born at Paris, September 4th, 1800, dramatic artist, and Alphonzine-Marie Bitter, daughter of D. Bitter, painter, aged twenty-one.

Bouffé's is a rare case (though we remember, not long ago, Mr. Samuel Carter Hall celebrating also his golden wedding), an isolated one it is

said in the theatrical world. His poor friend, Frédérick Lemaître, who died but the other day, would scarcely have cared to celebrate his *noces d'or*, and thought little enough of its precious reminder; indeed, it is said that married artists are not invariably like other men, fortunate in their married lives. But Bouffé has been, and the good old curé, Michel Perrin, wept all his tears of joy on the happy occasion.

The fine arts, so nearly related, rarely in Paris misunderstand each other, and the friends of the separate arts are found always ready to appreciate the difficulties, and to rejoice in the successes, of their fellow-labourers.

The sculptor Perraud, who died last week, was buried on Sunday at the cemetery of Mont Parnasse, and as a member of the Legion of Honour he was accompanied by a detachment of infantry, which, according to the new ministerial instructions (brought about by the recent incident at Félicien David's interment), retired after the religious service, and did not accompany the *cortège* to the cemetery.

M. Meissonier delivered an encomiastic discourse in the name of the Academy; and as he stood by the grave we were struck by the resemblance of his physiognomy to an excellent artist of our own, Mr. Fred. Leighton, notwithstanding the difference of years between the two great painters. Perraud's friend, M. Pasteur, said,—It may be salutary to recall to those cities who forget it, that they alone live through ages by the genius and the talent of some of their children. You well fulfilled your wish that your life should be devoted to work. Your house was ever open to the affection of friends and closed to the indifferent: *odi profanum vulgus*. That was one of the spurs of your genius. Look at those artists who mourn your loss,—Dumont, your old master, whose pride you were, and who loved you so dearly; Thomas, Bouguereau, Cabanel, Guillaume, Baudry, Cavalier, Garnier, Delchelle, Aubert, Ballu, Normand, André, Louvet, Bénouville, Crauk, Duprato, Villain, Boulanger, Merley, Lebouteux, Lepère, Curzon, ... the friends of Rome, the friends of your manly youth and noble ambition, Meissonier, Henriquet-Dupont, Robert-Fleury, Paul Dubois, Henner, Chapu, François Bazin, Lehmann, Gerôme, Martinet, Delaborde, Bonnassieux. . . . . I cannot cite them all. Listen to them; they repeat the names of the marbles to which you have given life,—the *Faun*, the *Despair*, the *Adam*, the *Adieux*, those marbles which antiquity would have envied. All repeat that one of the highest summits of French art has just been humbled under the hand of Him who reigns in the heavens, and who raises all empires.

Perraud, who was born in 1819, is but little known in England except by his figure of "*Despair*," now in the Palace of the Luxembourg: indeed, our acquaintance with French artists is exceedingly restricted; the works and names of a few well-known men are familiar to us, and Mr. Wallis does his best every year, in his gallery in Pall Mall, to familiarise us with the smaller works of French painters; but of their architects and sculptors we know but little, which, after all, is not much to be wondered at, as even when we know the names of our own artists, those at least who work with the chisel, we care little for the statues that they discover in the blocks of marble.

Here, when Sarah Bernhardt exhibited her clever group at this year's *salon*, the charming actress was at once noticed by all, and praised or criticised as she deserved. But not many of us took much pains to discern the merit of Schwenck Gilbert's bust of a Lady and we certainly were not too lavish in our praise of the same artist's "Wicked World," nor can we imagine much sympathy existing between Leighton or Millais, or Vicat Cole and Alfred Hunt, neither can we imagine Mr. Irving and Mr. Toole "cottoning." The friendliness of artists in Paris, and the conservative opinions on the subject of art, are owing doubtless to the teaching of the *Conservatoire* and to the influence of the *Académie des Beaux-Arts*, which makes artists regard each other, and the public respect them. Imagine the horror of French artists, on hearing that the Government now sitting at Versailles should propose to entrust the duties of the professors of the great science of architecture to the tender mercies of "officials and clerks," as Sir Gilbert Scott stated the other night * was threatened by our Government, which surely must be a melancholy joke.

Paris.

* See *Builder* for November 11th.

PROFESSIONAL TOPICS FROM A PROFESSIONAL POINT OF VIEW.*

THE INSTITUTE.—COMPETITIONS.—THE VOLUNTARY EXAMINATION AND ARCHITECTURAL EDUCATION.

We might do much as a society by hearty co-operation with other bodies (and especially with the Institute) for the advancement and improvement of the profession, whose interests we all have at heart. I propose to devote a few minutes to the consideration of what the Association can do as a body to benefit the profession of its members. I do not think it would become us to discuss here the internal affairs of the Royal Institute of British Architects, but since it is no secret that two important special committees of that body have in succession for several years been engaged in drawing up schemes for its reform and improvement, I think we may assume that it is felt by its own members that such reform and improvement have become necessary. What, then, should be the attitude of our society towards it at such a juncture,—at a period which may almost be called a crisis in its history? The Royal Institute is the only recognised professional body which has any title whatever to regulate or guide all those questions of general policy which must constantly arise in such a profession as ours. Possessing a Royal Charter, and numbering amongst its members almost all the foremost men in the profession, in town or country; with a history of considerable achievements in the past (as any one who will read Mr. Eastlake's late paper on the subject will readily admit); and with the prospect, if only it be properly supported by the members of the profession, of still greater usefulness in the future, I think that we have in the Institute the best hope of that professional organisation which we all admit to be necessary. And when I find, as I am sorry to say I do find,—a large number of my friends amongst the younger members of the profession, in this Association and out of it, who refuse to join the Institute because it does not, in their opinion, come up to the standard of efficiency which they think it should reach, I am convinced that these very men are doing the best they can to prevent the Institute achieving the position which they assert it ought to hold. If they do not wish the Institute to acquire authority with the public in matters relating to the profession, or if they do not wish it to become the recognised tribunal for all disputed matters in the profession itself,—if, in fact, they think (as their action seems to prove they do) that there is no necessity for any such recognised professional institution to exist at all, then I can understand their abstention from membership. But while their deeds seem to show this, the language they use with reference to the Institute is very different. They say they think its constitution so bad, its policy so weak, and the advantages which it offers to its members so small, that they do not care to enrol themselves. Now, as I said before, I do not think this the proper time or place to discuss the internal affairs of the Institute. I do not mean to attempt any defence of its constitution or policy. But I do say that if these are to be improved, and if it is to hold the position at which it aims, and which, I confidently trust, it will attain, it will be by a large increase in the number of its members that it will be chiefly strengthened and made more useful, and those who are standing out and declining to join are not, in my opinion, doing their duty to the profession to which they belong. I would strongly urge, therefore, all those amongst us who are eligible to join the Royal Institute of British Architects. This is, I think, the duty of our members individually; and I think that as a body it is both our duty and our interest to support the Institute by every means in our power. It is not long since some gentleman, whose motives, I am sure, we all respected, and whose sole object was the good of the profession, proposed an amalgamation of the two societies, or rather an affiliation (I think that was the term used) of the Association to the Institute. It was, however, felt by most of us that the scheme as proposed would not work, and by almost all of us that it was, at any rate, premature; but I am very glad indeed that in the way in which the negotiation was conducted on both sides, and in the manner of its termination, there was nothing to disturb the good feeling which has of late subsisted, and which, I trust, will always continue, between the two bodies. Indeed, I think I may say that our relations have become even more cordial than before, and that the great honour done us by the presence of the president of the Institute at our annual dinner, and his kind words of encouragement and congratulation, have had the best possible effect. I trust we shall continue to maintain the integrity and complete independence of the Association as the junior professional society. I believe that each will get on better by itself, and that the good of the profession will be best advanced by our continuing as separate bodies, actuated by a common desire to promote the interests of our craft,—the junior body looking to the senior for encouragement, advice, and support; the senior regarding the junior as its nursery for the production of members.

We cannot attempt with propriety any general scheme for the regulation of the professional conduct of members; but I think it is in our power to aid the efforts of the Institute in many important particulars,—especially, I think, in the matter of competitions. At first sight it might appear that the interests of the senior and junior members of the profession might not be identical in this matter; but I think that a little consideration will show that they are. It is often said that the practice of offering work to competition gives younger men an opportunity of coming to the front, and no doubt this is so; and this is the chief, if not the only, advantage of the system, so far as the profession is concerned. It is, therefore, certainly to the advantage of the younger members of the profession that competitions, if fairly conducted, should continue to take place. But it is as much to the disadvantage of the juniors as the seniors that unfair terms should be offered, and that there should be always a number of men ready, on *any terms*, however unfair, to come forward, and, on the chance of obtaining work, to practically cut one another's throats, to the prejudice of the profession generally. It brings the profession into contempt that such a state of things should exist, and the younger men uselessly waste a great deal of time and money which might all be saved by a little combination amongst ourselves. If we will be true to one another in this matter, and combine to adopt measures for obtaining fair terms from the proposers of competitions, I think a sphere of great usefulness in the profession would be opened to the Association. I do not want to convert our society into a trade union, but I see no reason why we should not take a leaf out of the trade-unionists' book in this matter. There need be no fewer competitions,—I think there would be more if the conditions could be made fairer. It is not to be expected that they will be made any fairer whilst, as at present, the supply of gratuitous designs more than comes up to the demand. If this supply were to fall short (as it is in our power, by combination, to make it), better terms would certainly be offered. How such a combination is to be made is the practical question. This I commend to your serious consideration. I think, if we could all agree to refuse to enter into any competition except on some such terms as those contained in the Institute paper of conditions of competitions, we are now such a numerous body that our influence on the production of designs gratis must at once be felt. But I feel sure that your committee will gladly consider any feasible scheme for carrying this suggestion into effect, if you think it desirable to do so.

There is another point on which I wish briefly to touch. I have been asked to refer to the Voluntary Architectural Examination, which, I am informed, is once more to be held this year, and on its success this time is to depend, in a great measure, its continuance in the future. I am one of those who are opposed to the introduction of the system of compulsory examination into our profession. I know there is a good deal to be said in its favour, and I consider that it is merely a question of a balance of advantages; but to my mind I confess the disadvantages seem to outweigh the advantages. Still, the arguments against a compulsory examination have far less force when applied to the question of a voluntary one, and the great advantage to be gained by the study necessary in preparation for such an examination cannot be gainsaid. I certainly think, therefore, that all those who believe an examination to be a good thing should use every endeavour to maintain the one now in existence. I do not wish to be misunderstood on this question of Examinations, and I will state briefly my reasons for thinking that a

* From the address of the President of the Architectural Association, Mr. H. C. Boyes, at the opening general meeting on the 10th inst., elsewhere mentioned.

compulsory examination is unnecessary, and would even be injurious, in our profession. The question seems to me to divide itself into two branches:—Firstly, is it necessary or desirable for the sake of the public? Secondly, is it necessary or desirable for the sake of the profession? Now, I admit that if by a compulsory examination the public could be assured that none but men practically and artistically competent could practise as architects, such an examination would be desirable. But I maintain that an examination cannot ensure such a result. You may by a severe examination ascertain that a man has a thorough scientific knowledge, theoretically, of the scientific branches of his profession; but it is often the very man who has the largest store of theoretical knowledge who has the least capacity for practically employing it; and your man of ready wit, tact, good sense, and experience in practical work (points which you cannot examine in at all), who may have but a tithe of the theoretical knowledge of the other, will yet be by far the better architect. As to art, you cannot examine in that at all. You may ascertain that a man can draw, but until he has tried his hand at building, you cannot tell how he will build. In Law and in Medicine, the public demand such guarantees as an examination can afford of the fitness of those who practise them, because lives and property depend on such fitness. But even here the guarantee afforded by an examination is a very slight one, and too often fallacious. In architecture, I believe, the guarantee of fitness afforded by an examination would be still less, and since at present our buildings, as a rule, when an architect is employed, do not prove dangerous to life and property, there is no general demand on the part of the public for such a slight guarantee of fitness as an examination affords. In the profession the outcry for an examination and a diploma chiefly arises from a pretty general wish to limit the number of architects, and to obviate what is certainly felt to be an evil in the existing state of things,—the possibility of any unqualified person who chooses to call himself an architect starting in practice without any proper training or education for the profession. But here it seems to me that a compulsory examination would not meet the evil; for either you must make it so severe as to exclude many men who would be perhaps better, practically, than the few who managed to cram in enough theoretical knowledge to pass; or you must make it so easy that anybody, by a very moderate amount of preparation, could get through, and so you would still have to admit all but absolute fools into the profession. No system of examination which is not combined with, and used as a test of, instruction, has ever yet been invented which a man of decent capacity could not cram for and pass without much difficulty. And all these examinations come to be ends in themselves, not means to an end. What is really wanted is a guarantee that a man has been properly trained in practical work, and has sufficiently studied theoretically the scientific side of his business. I think that a preliminary examination in general subjects to test the question whether or not the candidate has what is usually called "the ordinary education of a gentleman," and a certificate from an architect in practice that such candidate has spent three or five years in practically learning his profession, before he should be allowed to practise for himself, would answer the purpose of keeping improper persons out of the profession far better than the proposed examination. I look forward to the time when we shall have a proper school for teaching the theoretical part of our profession to a young man while he is learning the practical part of it in his employer's office. With such a school, examinations would be most valuable. A regular course of study would be laid down, and periodical examinations held to see that it had been followed with industry and success. But to begin with an examination without affording any such training is putting the cart before the horse. It reminds me of the story of the two shipwrecked Yankees, who, when at the point of death, wished for the consolations of religion, but the only religious exercise of which either of them was capable was comprised in the suggestion, "Let's have a collection." Training and education are wanted; as a substitute we are offered an examination. Still, this voluntary examination is the only thing we have at present in the profession which can be pointed to as a sign of our wish to raise its status to the level of the other recognised professions in the country, and as such I should regret to see it fall through. An attempt has been made to make our Class of Construction and Practice the preparatory course for the examination, and this is a step in the direction which I have pointed out. Perhaps it may lead to such a school for theoretical instruction as I have suggested, and while the examination is not compulsory there is little fear of its leading to the excessive cramming which I should anticipate if it were made compulsory. If ever it becomes compulsory we shall have a number of "crammers," who, for a few guineas, will guarantee to get any one who is not an incurable idiot through it.

MOVEMENT IN INDIA.

THE Indian journals are full of accounts of the disasters occasioned by the recent floods. Chief among these is the destruction of the Nerbudda Railway Bridge, twenty-five spans of which have been swept away, and when the mail left the rest were expected to follow. This bridge was regarded as one of the greatest engineering triumphs of the country, and consisted of sixty-seven spans, each span being 62 ft. 6 in. long, and supported by five thin cast-iron columns, two of which, and a double line of superstructure, have been added since the floods of 1867. The columns penetrate for a distance varying from 25 ft. to 40 ft., first into a bed of gravel, and then into blue and yellow clays, and are at the greatest depth as deep as the deepest in India. When the bridge was broken there were 59 ft. of water in the river.

A design is being prepared for a monument to be erected over the grave of Dr. Milman, the late Metropolitan of India, at Rawul Pindee. The work will be executed at Agra, at the express wish of the late bishop's family.

An hospital is about to be erected in the Great Valley, Travancore, in memory of Mr. John Grant. Mr. Horsley has provided the design for the building.

A very largely-attended meeting of civil engineers in Bengal was recently held in Calcutta, when it was resolved to found an Institution of Indian Engineers and to establish a professional journal in connexion therewith. The members of the Institution are to be divided into two classes — members and associates. Members are to be engineers, whether civil or military, whether in Government service or not, elected by ballot, under rules framed by a general council. Associates are to be scientific men, other than engineers, connected with the educational, telegraph, survey, geological survey, forest, and other scientific branches of the Government service.

The discussion with respect to Ranikhot v. Simla, as a sanitarium, still continues to excite much interest. Colonel Colley, who was deputed by the Government of India to visit the former place, is said to hrve reported concerning it that it is more central than Simla, and can be made much more easily accessible. It is also said to have better building sites, but the available space is more limited than was supposed, although the water supply is better than that of Simla. The report drawn up in Lord Mayo's time was rough and imperfect. The requirements, therefore, of the summer residence of the Government of India will have to be estimated afresh before an opinion for or against Ranikhot can be formed.

At a recent meeting of the Bombay Municipality, it was stated that Messrs. Gotto & Beesley, of London, propose to come out to Bombay, make the necessary studies for a project for a complete system of rain-water drainage and house-sewerage, and for the disposal of the sewage, for the sum of 10,000*l*. These studies to include a report describing the system proposed, detailed and working drawings, specifications, form of contract, and estimates, and all other information necessary for submitting the works to the competition of contractors of eminence. The *Madras Mail*, from which we derive the information at second-hand, seems to think the proposal rather an expensive one, and says that Mr. Clark's drainage scheme for Madras cost only 3,500*l*. It adds that the Hon. Mr. Ellis has stated, in an official report to the Government, that he has submitted Mr. Clark's scheme to competent authorities in England, and that they have pronounced it an excellent one.

The depreciation in the value of silver is likely to have an unanticipated effect. In consequence of the unfavourable rate of exchange, the Government of India have called on all departments of the public service, including guaranteed railways, harbour, and other public works, to note that in future they should refrain as much as possible from including English materials in their indents, designs, estimates, &c., and that they should call into requisition materials locally procurable to replace what has hitherto been wholly obtained from England, and that they should utilise and depend on local supplies as far as possible.

This year Mr. Juland Danvers, the Government director of the Indian Railway Companies visited India, and was much impressed with the dwellings of the European artisans employed on the various lines. In his annual report, which has recently been published, he says, "At certain places, on most of the railways, where more Europeans than usual of the mechanical class are brought together, consisting principally of drivers and those who belong to the locomotive workshops, dwellings are provided which collectively form a kind of railway town. On approaching these places they present quite an imposing appearance. Large square brick houses are seen placed in compounds or gardens, bearing a resemblance to the villas and mansions occupied by the wealthy citizens of a London suburb. A closer inspection, however, shows that this impression is deceptive. The grand appearance is produced by the broad verandah, so necessary to an Indian dwelling, and by the double story, which was, until lately, rarely seen in India. Each house contains perhaps eight rooms, and these are occupied by several men, some with families, who pay at the rate of from 9 rupees to 10 rupees a month for each room. In connexion with these colonies there are generally institutes, libraries, swimming-baths, billiard-rooms, churches, schools, co-operative stores, hospitals, recreation-grounds,—everything, in fact, that can be thought of to afford occupation for the mind and body. It is very desirable to attend to the health, comfort, and amusement of European mechanics in India, as well as to the education of their children. There are great temptations to indulgence and excess, and it is obviously expedient to secure well-behaved, steady, and intelligent European communities of this class in the heart of India. This is now the case, and at several stations well-disciplined and efficient corps of volunteers have been formed by the railway servants."

The Count de Richmont is reported to have given to the Bishop of Pondicherry the sum of 10,000 francs to be employed in constructing an hospital exclusively for old people of all religions. The bishop has given a site on the ground belonging to the French Mission, and a lottery has been set on foot to obtain funds to carry out the project to the extent which is desired, and which will suffice to meet the wants of the population.

The Secretaries in the Department of Public Works, Madras, are working away at the reorganisation of their Department, and at the forming of a code. District engineers, it is stated, are to be abolished; superintending engineers are to be revived; there are to be seven instead of eight superintending divisions; and the ranges are to be doubled up, so that a range will in future always be in charge of no one below the rank of assistant engineer.

When Mr. Noble, the sculptor, died, he was engaged on a bust of the late Lord Hobart, Governor of the Madras Presidency. The work was so far advanced that he had succeeded in producing,—with the aid of a post-mortem cast, photographs and other portraits, and his own personal recollection of Lord Hobart,—a clay model that is said to be a wonderful likeness, and under these circumstances there will be comparatively little difficulty in producing the marble bust, which is intended to be placed on a monument in Fort Church, close by Lord Hobart's grave.

The Allahabad paper says it is rumoured that the Government of India have offered to let the East Indian Railway Company have a certain number of assistant engineers from the railway branch of the Public Works Department. It adds:—"This looks ominous for the hopes of a further State Railway extension, and points to a general reduction of the engineers' establishment. It is, also, we fear, a bad look out for Cooper's Hill, and, indeed, for the service generally." The forthcoming Railway Conference in Calcutta will probably be opened by the new Finance Minister, and the members of the Supreme Council are expected to take part in the proceedings.

The *Madras Mail* contains a copy of a long letter of Mr. Parkes, which the Secretary of State for India has forwarded to the Local Government, relative to the harbour works.

Mr. May, the late superintendent of the works at Madras, had evidently become alarmed at the subsidence which had occurred at the Mandra Breakwater, Kurrachee, also in course of construction under Mr. Parkes's direction; and through the Government he propounded various queries.

A NEW DOCK FOR TIMBER.

THE Surrey Commercial Dock Company opened on the 7th inst. an extension of their already elaborate system.

The new dock, named the Canada Dock, is designed to meet the necessary requirements of the timber trade, the present demands of which are attested by the quantity of timber in the Company's yards and ponds, which at the present time consists of 80,000 loads of floated timber, 7,876,000 pieces of landed timber and deals, 2,590,000 pieces of boards, and 2,158,000 staves. There are also 120,000 quarters of grain in the extensive system of granaries.

The Canada Dock is almost in the south-west corner of the Company's system. It is rectangular in shape, and its western quay is over the East London Railway, just before it enters the Thames Tunnel. Its dimensions are 1,500 ft. in length, 500 ft. in width, with a water area of 16½ acres, and a depth of 27 ft. of water under Trinity high-water level. It communicates with the existing Albion Dock by an entrance of 50 ft. in width. The quay space surrounding the new dock is upwards of twenty-one acres in area. The walls are mostly built of concrete, that for the facing being set in blocks from a ton and a half to two tons in weight, dovetail-shaped, and bonded into the concrete backing.

The Surrey Commercial Docks have been extended from time to time, until they now comprise ten docks and seven timber ponds, with an aggregate water area of 176 acres, and land or wharfage area of 193 acres, making together an area of 369 acres of dock property. The docks have four entrances from the Thames, at different points, extending over a length of 1¾ mile of the river. The length of the quays available for shipping is five miles. The new dock has been constructed from the designs and under the direction of the Company's engineer, Mr. James A. McConnochie, C.E., the contractors being Messrs. Thomas Docwra & Sons, of Ball's-pond, Islington.

The first vessel to enter the dock was the steamer *Argyll*, of 1,185 tons, belonging to Messrs. Bailey & Leatham, of Hull and London; and this was followed by the fine sailing-ship *Greyhound*, of 1,411 tons register, belonging to Mr. Nelson, of South Shields.

NEW RAILWAY WORKS AND THEIR COST.

THE MIDLAND.

THERE is no railway company which has spent more money on new lines and new works, during the past few years, than the Midland, and probably no other company gives a fuller or more detailed account of the expenditure. Each separate work is fully set forth in the accounts, and in addition to the outlay already incurred, the further amount required to complete unfinished works is also given. We have compiled from the directors' reports the subjoined summary and analysis which shows the amounts expended and charged to capital under all the different heads during the ten half-years ending June last.

Under the first head of "Lines open for Traffic," it is shown that, in their original construction, the capacity of the lines was very far short of the actual requirements for traffic purposes; and in further land purchases, duplicating lines, making new sidings, extending the station and warehouse accommodation, and generally improving the carrying capacity of the line, an enormous amount has been expended, the lines having been only gradually brought up to their present state of efficiency. The additions made in this way to the original cost have been at the rate of about 1,050,000*l.* per annum, or on the mean "open" mileage not less than 6,000*l.* per mile in the period of five years. In other words, the property has been, in five years, improved at a cost almost equivalent to the construction of an additional single line throughout the entire system. On referring to the last-issued report, we find also the expenditure of this character is by no means exhausted, for in the current half-year 821,000*l.* were to be laid out in providing increased station accommodation, sidings, engine-sheds, workshops, &c., on the lines already open for traffic; and even afterwards the known necessities of the lines would take 849,000*l.* further to meet them. The whole of this additional outlay has already received the sanction of the proprietors.

Under the second head we have the expenditure upon the construction of new lines. Spread over a lengthened period, and embracing a vast number of new lines variously situated, this branch of the expenditure throws some light on the relative cost of (1) land, and compensation paid for property taken over by the company; (2) the construction of the lines, including structures, signals, rails, &c.: and (3) the by no means inconsiderable amount represented by legal and Parliamentary costs, including conveyancing, &c. The proportion of the cost attributable to each of these distinct heads would appear to be:—

Land and compensation.....	11	per cent.
Construction, including rails, &c.	88	„
Law and Parliamentary.....	1	„
	100	

The gross outlay under this head, it would appear, has been 4,892,000*l.*, for which about 200 miles of new line have been added to the Midland system, the cost being equal to about 25,000*l.* per mile. The further expenditure under this head will be no less than 3,500,000*l.*, to complete the 122 miles wholly, and 49 miles partly, owned by the company, and still under construction or to be constructed.

The further heads of expenditure during the five years comprise 2,336,000*l.* for new rolling stock, and a similar amount subscribed to other connecting lines in which the Midland are interested. For the latter object 1,000,000*l.* further will be subscribed in the current and future half-years.

It will thus be seen that the company have been laying out 3,000,000*l.* per year for some years back, and we may believe that it has been judiciously applied, judging from the high dividend position the company has been able to maintain concurrent with this enormous expenditure.

PROGRESS IN VENICE.

SINCE the "Queen of the Adriatic" was welcomed back into the arms of a United Italy, great steps have been taken to improve the city, and render her condition more worthy of her old renown, and more favourable to the new growth which it is hoped her commerce will assume. The works of excavating and deepening the harbours and the leading canals for the navigation of the port have been continued and extended. New warehousing docks have been erected, portions of which are already open, while extensions are in progress. A large graving-dock has been completed, with a spacious basin of 17 ft. in depth. 40,000 cubic mètres of cement are said to have been employed in this work. According to a report by Consul Smallwood, this makes the second graving-dock recently constructed, the smaller of which is of the following dimensions: Length, 297 ft.; breadth, 66 ft.; depth, 26 ft. The tides vary in an extraordinary degree here; ordinarily they rise or fall 3 ft. at the equinox. The depth of the graving-dock under the medium height of water is 20 ft.

A new opening to the arsenal has been recently made, and is being further deepened; and a small island between the two dockyards, Nuova and Nuovissima, is being removed, in order to admit of the entrance of the largest vessels.

The improvements in the city, and the deepening of almost all of its internal canals, have been incessantly continued. Squares and streets have been enlarged, new and ample bridges constructed, the navigation of the canal of the Seriola reorganised, and important works built at the Lido. Besides this, the construction of a new cemetery has been pressed forward, and the new building for the safe storage of the art-treasures of the city museum has been completed. The erection of special warehouses for the storage of petroleum shows both the growing importance of this trade and the care that the city shall not be endangered by its existence.

On the island of St. Clement, says Mr. Smallwood, which is about two kilomètres distant from Venice, has been erected and opened a new and magnificent female lunatic asylum; its area is 12,000 square mètres. It is divided into nine spacious courtyards; and 300 very healthy rooms, lighted by 900 windows, have been constructed. At present about 400 lunatics are inmates, but 600 might be accommodated, besides the physicians, nurses, and servants.

An aqueduct for conveying water to the city from the canal della Seriola Veneta is in course of construction. Mr. Ritterbrandt, who represents British capitalists, is now taking the necessary steps for carrying on the works.

LIVADIA.

As Sanssouci was the favourite retreat of Frederick the Great, so Livadia is the quiet resort of the Russian imperial family. It is the first of the handsome villas on the road from Jalta to Alupka, and belongs to the Empress Maria Alexandrovna. Three versts from the former place begin the vineyards and the extensive park. The castle of the heir-apparent, built in Eastern taste, peeps through luxuriant vegetation. The deep balconies, shaped like kiosques, surrounded by fine lattice-work, the coloured brickwork of the high chimneys in form of turrets and minarets, create a wonderful effect among the mass of foliage. The interior arrangement of the castle corresponds to the surroundings. Variegated couches, carpets, small cosy rooms—everything breathes simple splendour and comfort. A neat, light staircase leads to the roof of the castle, where there is a spacious terrace-also surrounded by fine lattice-work, and pro-

Analysis of Capital Expenditure from July, 1871, to June, 1876, inclusive (compiled from the Directors' Half-yearly Reports).

Half-year ending	Upon Lines open for Traffic.					Construction of New Lines.				New Rolling Stock.	Subscriptions to other Lines.	Sundries.	Gross Total.
	Land and Compensation.	Construction of Way and Stations (including Rails, &c.).	Law and Parliamentary Charges.	Block Telegraph.	Total.	Land and Compensation.	Construction of Way and Stations (including Rails, &c.).	Law and Parliamentary Charges.	Total.				
	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.
Dec. 1871 ...	86,627	268,886	15,242	4,747	375,502	60,312	389,687	6,893	456,892	268,777	161,586	—	1,262,757
June 1872 ...	160,699	289,596	6,775	7,017	464,087	53,100	350,478	2,695	406,273	142,431	42,613	—	1,055,404
Dec. „ ...	137,075	306,033	11,808	2,883	457,799	77,858	329,974	10,526	418,358	243,508	408,176	6,802	1,534,643
June 1873 ...	112,360	355,182	2,978	2,687	473,207	42,301	346,588	2,386	391,275	264,156	242,885	14,327	1,385,850
Dec. „ ...	222,489	414,494	15,716	1,109	653,808	17,007	412,299	1,867	431,173	258,776	241,682	4,928	1,590,367
June 1874 ...	119,470	382,589	12,706	5,833	520,598	18,799	480,849	6,460	506,108	160,034	322,825	4,298	1,513,863
Dec. „ ...	86,888	301,531	15,571	1,680	405,670	30,725	545,408	3,127	579,260	105,096	211,247	12,065	1,313,338
June 1875 ...	87,593	343,346	22,806	2,068	455,813	61,857	482,020	3,413	547,290	297,459	156,739	10,696	1,467,997
Dec. „ ...	218,060	413,411	13,955	3,940	649,366	121,356	664,057	8,404	793,817	306,449	296,182	38	2,045,852
June 1876 ...	160,824	632,648	15,057	5,221	813,750	52,924	306,679	2,716	362,319	289,570	246,780	544	1,712,963
Totals...	1,392,085	3,707,716	132,614	37,185	5,269,600	536,239	4,308,039	48,487	4,892,765	2,336,256	2,330,715	53,698	14,883,034

vided with a cover for protection against the fiery rays of a Crimean sun. From hence the chain of the Yaila and the Black Sea offer the most charming and animated view, bordered on the one side by the beauties of Jalta, Massandra, Nikita, on the other by the fantastic forms of the rocks of Orianda, the graceful bays towards Alupka, and the whole unbounded extent of the ocean, which seems to reach beyond the horizon. Behind the seat of the heir-apparent rises the castle of the emperor, which also corresponds entirely to the purpose for which it was erected. For here in the salubrious climate of a scenery rich in natural beauties its illustrious owners seek solitude and rest from the labours of governing. On that account the imperial castles are distinguished neither by great splendour nor by large dimensions, but strike only by their artistic simplicity and comfort. This castle was built by Count Potocki. It has remained almost entirely unchanged, and has only been enlarged by the addition of a spacious gallery serving as dining-room. In the latter is placed a fountain and the statue of Penelope, in white marble, a present of the merchants of Odessa. The Roman Catholic chapel of Count Potocki has been changed into a small Greek church, of sombre beauty of style. The principal façade of the castle is turned towards Jalta. The arrangement of the balconies, windows, galleries, and external decorations of the building bespeaks a clever artist and architect. On the terraces before the castle are flower-gardens of rare beauty, and at a short distance rises a charming arcade covered by roses and creepers, and supported by slender cast-iron pillars. Amongst others, a species of white and light yellow roses attracts the attention by its exquisite fragrance. From hence, as well as from every other point, there is a splendid view towards Jalta and the surrounding mountains. The foreground to this landscape is supplied by the large park and the vineyard, with its neat keepers' cottages and its platform, and surrounded by a balustrade. The view towards the other side is no less beautiful: the whole sea-shore to the Cape of Ai-Todor, descending almost perpendicularly to the edge of the water, and fringed by castles and villas; the whole Orianda with its gigantic rocks overhanging the Black Sea; and somewhat further, Gaspra, Koriis, Mischoe, and finally Alupka. On one of the rocks, between dark pine-trees, glimmers a white light-house. The prospect by moonlight, when the sea trembles under the soft beams of the moon, and Luna sheds a fantastic light over the rocks of the shore, the gorges, and the luxuriant gardens, is quite enchanting. The lighthouse throws a bright ray of light far into the sea. The scent of orange-blossoms, the murmuring of the ocean, and the dark blue sky, complete the beautiful, fairylike scene, reminding us of the shores of Sicily. This is the paradise in which the imperial family of Russia spend their leisure-hours.

THE NEW BRIDGE OVER THE REGENT'S CANAL, CHALK FARM ROAD.

For some time past a new bridge has been in course of construction across the Regent's Canal, in Chalk Farm-road, in place of the old bridge, built in the year 1815, which had not only become unsafe, but also quite unsuitable to the heavy traffic constantly passing over it, owing to the old arch making the gradient severely steep. The new bridge, which is being built at the cost of the St. Pancras Vestry, has been designed by Mr. W. B. Scott, C.E., and will be a great improvement on the old structure which it replaces. The bridge consists of five wrought-iron girders on Aberdeen granite bed stones, which rest on massive brick abutments, on the north and south sides of the canal. The foundations of the abutments are on a bed of concrete, 2 ft. 6 in. in thickness, which rests on the London clay, 12 ft. below the bed of the canal, and reached during the borings. There is an exceptional peculiarity about the girders, which rise up several feet above the level of the carriage and footways. The central girder divides the carriage-way in a manner similar to that in which the up and down lines are divided by the bridges on several of our railways, whilst the two inner east and west girders respectively separate the footways from the carriage-way, the two outer girders forming the parapets. Another novel feature in the construction of this bridge consists of two of the girders (those between the footways and the carriage-way) having been so constructed as to be utilised as gas-mains. These mains, formed in the girders, are 34 in. in diameter. They are made perfectly gas-tight, the expense of this portion of the work being borne by the Gas Light and Coke Company, with whose mains they will be connected at the north and south sides of the bridge. One of these girder-mains was tested on Monday, the 6th inst., whilst we were present, by the gas company's officials, the results of the testing being perfectly satisfactory. The platform of the carriageway and footways will be built upon the lower flanges of the girders, which, whilst it will materially reduce the gradients and improve the approaches to the bridge, will at the same time maintain sufficient headway for the barge traffic on the canal. The roadway over the bridge will be formed of cross and longitudinal girders, covered in by curved floor-plates and bituminous concrete, the face of the roadway being laid with wood pavement. The upper portions of the main girders will be surmounted by ornamental cast-iron work, with stone pilasters at each end supporting handsome iron columns and globular lamps. Each side of the main girders will also be ornamented with panelling and mouldings. A new towing-path has been constructed in front of the north abutment. It is 10 ft. in width, leaving a clear water-way of 40 ft. as against 22 ft. before the old bridge was removed, being nearly double what it was formerly. It is continued round the north-west side of the abutment, and comes into Chalk Farm-road on an inclined plane.

The works are in a very forward state. The whole of the girders are already fixed, and half the bridge has been thrown open to the public for traffic. The tow-path, incline, walls, and railings are in an advanced state, and the bridge will be entirely completed and opened in a few weeks. The roadway and approaches, which at present are only of a temporary nature, show the great improvement which has been made in the gradients. It may be stated that in order to expedite the completion of the undertaking the works have been in progress both day and night, and by the aid of temporary wooden bridges the traffic has not been interfered with.

The contractors are Messrs. Wall Brothers, Mr. Duguid acting as superintending engineer, and Mr. Abbott as clerk of works.

MONUMENT TO THE LATE MR. DINGWALL FORDYCE, M.P.

The tenantry and friends of the late Mr. Dingwall Fordyce propose to erect a monument to the memory of that gentleman, according to a design furnished by Mr. Matthews, architect, Aberdeen. The proposed monument, which is in the Roman style, is in the form of a steeple, 15 ft. square at the base, and rising to a height of 84 ft. Above the square base rise three stages or sections, the highest tapering to a point. The lowermost stage is about 23 ft. in height; and on one side there is an opening with iron gate, arched top, and moulded archivolt. The second stage has a niche on each side with splayed base, arched top, and sunk panel, in one of which, over the gateway, is space for an inscription. The third stage is octagonal, and is about 17 ft. in height, with arched openings on each side, and pilasters at the corners. The fourth or topmost stage is a tapering spire.

The site selected for the monument is the Hill of Culsh, in the vicinity of the village of New Deer.

The monument is estimated to cost 500*l*.

SOCIETY OF BIBLICAL ARCHÆOLOGY.

This Society held its first meeting for the present session on the 7th inst., at 9, Conduit-street, Dr. Birch, president, in the chair. The following papers were read:—"Memoir of the Life and Labours of George Smith," by W. St. Chad Boscawen. In this *éloge* a grateful tribute was paid to the memory of an Assyriologist whose life and labours were from the first associated with the interests of the Society. "Notes on the Himyaritic Inscriptions contained in the Museum of the Royal Asiatic Society of Bombay," by Captain W. F. Prideaux. This paper contained an analysis and translation of several interesting votive inscriptions, two of them being of some length, and forming an important addition to Himyaritic philology; also "Some further Notes and Observations upon the preceding Inscriptions," by Dr. Heinrich Müller. This paper consisted of further critical remarks written by the author at the request of Captain Prideaux. An interesting paper "On the Writings of Ephræm Syrus" was read by the Rev. J. M. Rodwell, M.A. The last paper of the evening was read by Mr. C. T. Newton, of the British Museum. It was on a Greek inscription from Caria, and its interest lay in its bearing on the Carian language, which as yet may be ranked among the unknown tongues.

The Society of Biblical Archæology have just taken rooms for their library at 33, Bloomsbury-street, which will be shortly opened, and will thus give members the advantage of being able to consult works all more or less bearing on the subject of Biblical knowledge. The Society has now existed since 1871, and its members have very largely increased in number.

THE WAR OFFICE, PARIS.

One of the most important works undertaken by the municipality of Paris is the construction of the Boulevard St. Germain, commencing at the Pont de la Concorde and terminating near the Jardin des Plantes. The piercing of this boulevard will disturb the quiet old legitimist quarters, and the late *royal fournisseurs* of the Rue du Bac will be put to confusion. Further away, workmen have already laid low a portion of the Rue de l'École de Médecine, and the Rue Larrey has completely disappeared. It was in the back room of a wine-shop which stood at the corner of this street that the terrible trio, cynical Marat, blustering Danton, and cunning Robespierre, *toujours gentilhomme*, nightly met to prepare the list of next day's victims. The only object of interest worth preserving (an old *tourelle*) has been deposited in the Carnavalet museum. Trees are already planted in this portion of the new thoroughfare, and light and life abound.

When the commencement of the Boulevard St. Germain was completed, now more than twelve years ago, the Imperial Government charged one of their architects, M. Bouchot, with the construction of a new façade to the War Office. The work was begun in 1867, and continued without interruption up till 1870; it was then discontinued on account of the war and the Commune, and recommenced at the end of 1871 It was finished on October 20th, with the exception of the interior arrangements.

The two façades, the old in the Rue de Solferino, and the new one on the Boulevard St. Germain, forming, as they do, a very obtuse angle, M. Bouchot boldly ventured upon the elevation of a tower, which harmonises admirably with the remaining part of the façade, consisting of a central pavilion, on the pediment of which, in the centre, is seated an allegorical figure of France, with two lions reposing at her feet; over the portico is a finely-sculptured head of Hercules; and emblems of war form the remaining portion of the decorations. Over each window on the first story are sculptured heads of mythological heroes. This central pavilion is flanked by two similar ones, less richly decorated.

The decorative sculpture was executed by M. Hamel, under the direction of the architect. The heads, figures, and trophies are the work likewise of M. Hamel, and of a very talented carver, M. Duchoiselle; the lions are the production of M. Rouillard, sculptor, professor of drawing at the Government National School of Design. The total cost of the building amounts to 2,400,000 francs (96,000*l*.)

Tunnel Building.—Mr. John C. Trautwine C.E., of Philadelphia, has patented a new method of constructing sub-aqueous tunnels. He proposes to abandon the usual method of tunnelling under the bed of the stream, and in its stead to construct the tunnel above water upon a strong, solid, wooden platform, several feet in thickness, which shall serve as a base for it to rest upon after it is finally deposited in its place. The tunnel and its platform are to be sunk into a trench dredged across the bed of the stream for their reception, the depth of which, varying with circumstances, will sometimes leave the greater part of the tunnel above the bed of the stream, and at other times it will be more or less below it. In either case the tunnel may, if necessary, be protected from injury by ice or other floating bodies by being surrounded by loose earth and stones. When the bottom of the stream bed is soft or unstable, piles must be driven to receive the platform.

THE WAR OFFICE: BOULEVARD ST. GERMAIN, PARIS.

THE WAR OFFICE: BOULEVARD ST. GERMAIN, PARIS.—M. BOUCHOT, ARCHITECT.

ARCHITECTURAL TEACHINGS IN AMERICA.

AMERICAN INSTITUTE OF ARCHITECTS, PHILADELPHIA.

THE closing address at the tenth annual convention of the American Institute, already referred to, was delivered by the Rev. Dr. E. L. Magoon. Parts of it were greatly disfigured by sectarian feeling. We print the concluding portion of it. After some good set abuse of Wren, and pointing to the restorations at Ely and Chester, to show that, "so far as an architect feels repugnance to Catholic dogma he is incapable of reproducing Mediæval art, even when the purest specimens are directly before him," the lecturer said,—

Look out upon this goodly city, or any other of our land, and you will see at a glance a score of pretentious churches, with towers guiltless of bell or clock, having spires that taper away into nothing but glaring ball and pointed iron bar,—a pumpkin and poker,—absolutely nothing more! Why allow yourself to be a party to such absurd perpetrations? As obelisk and cupola are irrelevant to Greek entablatures, a true spire is an architectural impertinence upon any structure either Byzantine or Romanesque. Upon a Christian edifice no summit is complete without its congruous finial, and the crowning apex never properly ends but with that divine emblem alone, by which, from nave, transept, and sanctuary foundation, up through a thousand converging lines, all was inspired and unified, the cross. It costs no more to build consistently than absurdly. Architects who understand their business know that 1,000 or 10,000 dollars can be put into chapel or church of rustic materials, free of all constructed ornament, and yet marked by as true lines of distinctive beauty as any metropolitan fabric that has cost millions to execute. Are you applied to for a specific design? Ask where and for what use is the prospective edifice, and at what cost. You know the material, see the ideal, and indicate in sharp outline, the perfected creation to be realised. That done on your part, the elaborated plan which was carefully studied, each separate member in its relation to every other, as an organic whole, may, to please capricious whim, or shrink under parsimonious demand, be outrageously mutilated. Well, let the pious parties so murderous in their conduct be speedily hanged without benefit of clergy. It is a sad necessity, doubtless; but better that a few nuisances be put under ground at once than that a disfigured masterpiece of art be obtruded upon the agonised public in perpetual gaze. In all true architecture it is impossible to separate the soul from its body; as in the vegetable and animal kingdoms, every integral part is the result of structural necessity. In nature, this organic law admits of exemplification infinitely diversified, and no less in art, as Mediæval works most abundantly attest. Then, the exponents of a vital growth did not struggle to adapt fresh conceptions to effete forms, but perpetually modified antiquated shapes, thereby playing forth with yet gladder freedom the full advantages of new ideas. A competent architect will create beauty out of the means that are furnished him by the nineteenth century, as in the thirteenth a prodigious number of churches, palaces, and châteaux, all different in plan, were achieved, yet each one as original in form as it was related to distinctive time and use. Wealth is most wisely used in giving grandeur to public works, adding ornament to utility, and shedding splendour on the profitable, thus rendering every structure connected with popular progress a monument of national magnificence. The divinest authority taught that artistic excellence is not extravagance, but beneficent thrift.

Architecture commemorates departed nationalities when their dominion is no more. It is our high privilege to rake the ashes and garner the wealth of universal remains, striving to emulate when we can neither rival nor restore. To strip earth of foliage, and reduce it to a naked ball; shear the sun of his beams, and blot effulgence from the stars, would be no more devastating to physical welfare, than it would inflict mental injury to ignore the ennobling influence of architecture on mankind. The bases of the arts touch each other, and no devotee can be expert in either who does not earnestly relish all. Magnanimous admiration appropriates the excellence it confronts, while ungenerous depreciation is its own punishment, because envy is impotency. Since God will not have His work made manifest by one who is ashamed of truth anywhere, the cowardly are never creative. Only as divine integrity kindles the fearless but friendly heart will fluent fingers elaborate works divine.

Every nation can do something which others cannot, showing that the net amount of mankind does not greatly vary. As each person is superior to all others in some individual faculty, that one is altogether the noblest who most assimilates himself to the best in each competitor, and so aggregates every variety of worth. We are most divinised by closest contact with truest symbols of divinity, those temple glories which have been the culture of humanity in all ages. In their presence the mind spontaneously opens, responsive to laws which traverse the universe, suggest infinite relations, and inspire the wish to admire evermore. In rendering worship to exalted worth, we elevate ourselves, and just so far as we evince sensibility to superior merit we are by it imbued. Great masters raise us from our own dead level by their generous aspirations; they lift us into the magnificent scope of their own free souls, and endow us with a more heavenly existence. Lapsing centuries only add preciousness to such men and their works; time, which defaces or obscures the fairest things, but dissolves temporary mists which overshadow them, and they reappear with enhanced splendour to the clarified vision of remotest generations. Great architects are ever-living wealth. They constitute the foremost life of the eras to which they pertain, and send vitality down to ages which long after supervene. There is a power in architective genius to quicken disintegrated clods. The dead in the limbo of extinct marvels hear it, responding to its call in the resurrection of a newer and more divine existence. At ten o'clock in the evening of October 11th, 1492, near this very hour, lurid light was first seen by Columbus on the eastern shore of a new hemisphere. Out through the dusky view before the great discoverer that night lay a whole world of all possible productiveness. And so, from the terminus of our first century in national progress, we contemplate the magnificent domain of predestined development. You cannot fail to perceive in sublime perspective the noblest arena ever offered to artistic competition, nor will you cease to ennoble your own manhood as the best guarantee of professional success. The Divine Architect has designed earth as an institute in which Himself is superintending the education of our race. Therein we should learn that the true, the beautiful, and the good are exactly co-ordinate, and neither of them can fully effect its end without the co-operative ministry of its associates in every sphere. It follows that the æsthetic virtue is its own reward. As the love of nature grows with the study of nature, so delight in art deepens and strengthens with magnanimous progress in devout pursuit. The laws of earth and heaven are connate, centralised in the human soul, that microcosmic temple wherein all creativeness unfolds. Parthenon and Pantheon, Santa Croce and Cologne, are only specimen copies after a divine model as yet but inadequately expressed. According to classic legend, Helen, when she explored nature for a model of a golden cup that she should offer upon the altar of Diana as perfectly beautiful, found nothing more exquisite than her own bosom. Nor is there anything in creation we can present to the Creator more worthy or acceptable than our own immortal being, when fairly dealt with and elicited. May each of you exemplify masterly skill in all charming design, and execute in your own person a consummate temple of the Holy Spirit.

ARCHITECTURAL ASSOCIATION.

THE first ordinary general meeting of this Association for the present session was held on the 10th inst., Mr. H. C. Boyes, president, in the chair. The following new members were elected, viz., Messrs. R. C. Gleed, C. M. Hudson, J. Bilson, F. W. Watts, A. S. Gover, J. J. Downes, R. F. Piotrowski, F. G. Coward, T. Townsend, H. T. Sugden, G. L. Luker, E. J. Butcher, W. G. Scott, J. E. Hatch, J. Irwin, jun., S. Everitt, J. Tolley, jun., G. Mann, A. Causten, T. W. Barry, and J. Smith.

On the motion of Mr. Aston Webb, the thanks of the Association were accorded to the entertainments sub-committee of the Association for their labours in connexion with the opening *conversazione* of the Association, and to the various gentlemen who had lent objects for exhibition on that occasion. Special mention was made of the services of Messrs. T. W. Cutler, H. H. Stannus, and R. Phené Spiers.

The Annual Report.

Mr. Hayes moved the adoption of the annual report, of which the following is a brief summary:—The committee congratulates the Association, not only upon the large number of new members* elected during the past year, but also upon the increased support given to the different classes, and the greater interest taken by the members in the working of the various branches. After detailing the work of the past session, in the shape of prizes competed for and papers read and discussed, the report goes on to say that an examination of the reports of the various classes shows that a larger number of names was entered, and that the attendance throughout the session was also better, than usual. "It is satisfactory to be able to add that the quality, as well as the quantity, of work sent in, shows the earnestness of the members, and their desire to carry out the objects of the Association." The Library has been used by as large a number of members as in any former session, although the number of country members availing themselves of its advantages has been less than usual. An important change has been made in the constitution of the Association during the past session, which has enabled the Birmingham Association to become a provincial branch of the London Association. "Perhaps there has scarcely yet been time for the committee to form a decided judgment of the advantages which may be derived from this step, but at least they may remark on the good feeling it has promoted between the students of London and the provinces, which, it is hoped, will strengthen the Association, and extend its usefulness. Many country members have availed themselves of the facilities for joining in the work of the Association, and the labour thrown on the secretaries of the classes and the librarian, by them and by the branch society, has been loyally and efficiently performed." The committee acknowledge the receipt of donations to the Prize Fund from Messrs. Quilter, Barnes, Boyes, Ferrey, Mathews, McLachlan, and Todd. The Architects' Benevolent Society has again received support from the members of the Association, and the committee invite further subscriptions to this most useful Institution.

The report was adopted, and on the motion of Mr. Douglass Mathews, treasurer, the balance-sheet for the past session was also adopted. The total income for the year was 496*l.* 16*s.* 9*d.*, including 341*l.* 13*s.* 6*d.* for members' subscriptions, 59*l.* 6*s.* 6*d.* for new members' entrance-fees, and a balance in hand at the commencement of the financial year of 10*l.* 13*s.* 3*d.* The total expenditure (including 30*l.* granted to the library) was 447*l.* 16*s.* 2*d.*, leaving a balance in hand of 49*l.* 0*s.* 7*d.* The assets are put down at 633*l.* 12*s.*, including arrears of members' subscriptions, estimated at 100*l.*, and estimated value of library, furniture, &c., 465*l.* The liabilities are only 45*l.*, leaving a balance in favour of the Association of 588*l.* 12*s.*

Library.—Mr. Pownall, the librarian, read the report of the Library Sub-committee for the past session, which stated that during the year 3,264 books had been taken out by the members, or rather more than 40 every time the library had been opened. Only five country members had availed themselves of the privilege of obtaining books from the library, owing, probably, to the expense of carriage. 30*l.* had been voted to the Library Fund by the Committee of the Association, and many donations in books had been made, notably by Mr. Edmund Sharpe, Professor Hayter Lewis, and the Council of the Royal Institute of British Architects. The best thanks of the Association were due to the various donors. The library now contained 800 works, 80 of which had been added (29 by presentation) during the past year. The amount received in fines for undue detention of books was 7*l.* 19*s.* In most cases it was believed that these fines were not incurred through inadvertence, but intentionally, the borrowers of books cheerfully paying a small sum for the use of the books beyond the time allowed by the rules. The receipts of the Library Sub-committee from all sources amounted to 45*l.* 8*s.* 3*d.*

Class of Design.—From the report of this class (read by Mr. Trubshawe), it appeared that the total number of members who joined the class at the commencement of the session was thirty.

* The "Brown Book" of the Association, issued before the commencement of the present session, states that the total number of the Association's members is 673, of whom 555 are resident in London.

four. The average attendance of members at the class had been twelve, and the average number of sketches submitted, eleven. These figures were stated to compare advantageously with those of past years. The number of members who rendered themselves eligible for the prizes offered to the members of the class by contributing a minimum number of eight sketches, was eight.

Class of Construction.—The report of this class (read by Mr. Hemings) stated that the progress made during the past session had been, on the whole, satisfactory. The number of members had increased from sixty-four at the commencement of the previous session, to seventy-six at the commencement of last session, although the number of *working* members had not shown a corresponding increase, seeing that while 111 papers were contributed during the previous session, only 114 papers were contributed during the past year.

Elementary Class of Design.—Mr. Berry read the report of this class. During the session the average number of members present at each meeting was twenty, as compared with seventeen in the previous session, and twelve in the session before that. The average number of sketches contributed at each meeting was fifteen.

Architectural Science Class.—The report of this class, read by Mr. Hesketh, stated that during the session ten meetings of the class had been held, at which nine papers were read and discussed.

Colour Decoration Class.—Mr. R. L. Cox read the report of this class, which stated that the past session had been a very successful one, both in respect of the number of members attending and the amount of work done. The number of names enrolled was fifteen, and at the eight meetings of the class there were seventy attendances. Thirty-three designs were submitted, comprising forty-seven separate drawings. The Council of the Institute kindly allowed the members of this class the use of the Institute library for purposes of reference, and the value of this privilege was enhanced by the kindness of the librarian, Mr. Kershaw.

The President then proceeded to deliver his opening address to the members. The substance of the address will be found on another page.

In the discussion which followed,

Mr. Phené Spiers characterised the address as an extremely practical and useful one. In reference to the Architectural Examination, he might say that there had never been any idea amongst its promoters that it should be made compulsory. Indeed, it could only be made compulsory, he presumed, by Government, and it was not likely that the Government would ever lay down a law by which every architect would be obliged to pass an examination before he could commence to practise. Some men, it was well known, had by talent and indomitable industry risen from the workshop bench to a high position in the profession, and the institution of a compulsory examination would exclude such men,—a result which no one would desire. But what was wanted was the laying down of some curriculum through which a man must have passed before he was publicly recognised as an architect. At present, almost any one who chose to assume the title was regarded by the public as an architect. As an amusing instance of this, Mr. Spiers related that a house-agent was once called upon to give evidence on an architectural question which came before one of our police magistrates. The evidence was objected to on the ground that the witness was not a professional architect. The magistrate asked him whether there was any ground for the objection. His reply was, that although he had not been brought up to the profession himself, he had a brother who had been educated for the profession, and with whom he had been in partnership. It was true that his brother had not "followed" the profession, and it was also true that his brother had been dead for many years; still he felt justified in calling himself an "architect." This story, Mr. Spiers said, reminded him of the man who, when asked if he could speak French, said he had a brother who could play on the German flute; but, notwithstanding, the magistrate admitted the evidence! But if such men as this house-agent could find people who were willing to entrust him with the building of their houses, it was impossible to put a stop to such a state of things at present. What was wanted was that young architects should pass the Voluntary Examination in such numbers as to make it generally understood that the certificate of having passed was the best guarantee of its possessor's qualifications as an architect. He strongly urged the members of the Association to go in for the examination this year. The Institute had done all that could be expected of it in relation to the matter, and it behoved the younger men of the profession to do their part. Although the examination would never be made compulsory in point of law, he believed it would, sooner or later, become morally compulsory; for pressure would be brought to bear upon the Institute, with the view of making the Associateship of that body dependent upon candidates for that position having passed the voluntary examination. The Institute must sooner or later yield to the pressure so applied, and therefore all who wished to become members would do well to pass the voluntary examination. In conclusion, he moved a vote of thanks to the president for his able address.

Mr. Lacy W. Ridge, in seconding the motion, said it was not within the range of human probabilities that the architectural examination would ever be made compulsory; therefore that consideration might be at once dismissed. As a voluntary institution the examination had failed, or had only been partially successful, simply through the apathy of the younger men of the profession themselves, and from no other cause.

Mr. S. Flint Clarkson deprecated the "patronising" tone which was sometimes adopted by senior members of the profession in speaking of the Association.

A Member suggested whether it would not be possible to make some of the work done in the classes of the Association serve in lieu of the probationary work required of students at the Royal Academy, and of candidates for the District Surveyors' Examination at the Institute,—in other words, whether work once gone through under the auspices of one of these bodies should not be "taken for granted" by the other bodies? By some understanding of this kind, much needless labour would be saved.

Mr. H. H. Statham said he heartily concurred in the remarks made by the President as to the necessity of maintaining the utmost cordiality of feeling between the Association and the Institute, and he hoped that such feeling would continue to exist. As to the system of competition, the President had spoken in favour of its retention, but he (Mr. Statham) confessed that the longer he thought about it the more he felt opposed to it. Why should architects be expected to devote so much time and skill to the preparation of designs on the mere chance of being appointed to carry them into execution?

The President.—They ought to be paid for it.

Mr. Statham said he thought that would be rather a difficult thing to carry out. One of the arguments in favour of competitions was that they brought unknown men to the front; but promoters of competitions would not go to unknown men if they had to pay them. On the whole, he thought the disadvantages of the competition system by far counterbalanced its advantages. The aggregate amount of gratuitous work done by the profession in the form of competition drawings in one year was something enormous. The profession ought to enter its emphatic protest against the system.

Mr. Stannus defended the practical character of the architectural examination, and denied that it was an examination for which it was possible to "cram." Many of the questions put by the examiners to the candidates could only be answered by those who had gained experience by actual contact with bricks and mortar. It was said that it was impossible to examine in "design," but he maintained that it was possible to do so. The "five-hours' design test" of the examination might, perhaps, with advantage, be prolonged to two or three days; but as it was it afforded no mean test of a man's ability to design. As to the suggestion for combined examinations made by one of the speakers in the discussion, he did not think it would be advisable that work done under the auspices of one society or body should be counted in another. The president had spoken of the want of an architectural school, but a most admirable school existed at the Royal Academy, and if architectural pupils joined it in large numbers, it would most probably be greatly improved and extended in its scope.

The President having made a few remarks in reply, the meeting terminated.

The next meeting will be held on the 24th inst., when a paper on "Binocular Perspective and Natural Drawing" will be read by Mr. A. Frere.

THE ARTISANS' INSTITUTE, CASTLE STREET.

We have received from Mr. Samuel Morley, M.P., copy of a report by Mr. J. F. Iselin, H. M. Inspector from Science and Art Department, South Kensington, on the technical classes held at the Artisans' Institute, and which is very satisfactory. Mr. Iselin says:—

"In these classes an intelligent man can see and learn all the branches of his trade. Should one fail, he is ready without loss of time for another. Or if a foreman be selected for his knowledge of the general details of the manufacture, a workman who attends a class of this kind and takes full advantage of the instruction is eminently qualified for the post. In this way, therefore, as a connecting-link between the science of individual processes and the handicraft of the workshop, technical classes of the character which are carried on at the Artisans' Institute should, I believe, not only be of very great benefit to the workman, but might be instrumental in furthering the industrial progress of the country.

Under the regulations of the Science and Art Department, no Government grants can be made in aid of such classes, but I think that nothing could be more worthy of the support of the manufacturers whose trades can be improved by the skill of the artisan, or of public bodies who can and will give money to raise the position of the working classes."

Mr. Morley adds:—"The subject is generally admitted to be of vital importance, not only to workmen themselves and their employers, but to the nation at large. But it is not easy to get the public (with all the numerous claims for pecuniary assistance put forward at the present time) to recognise the need of giving due support to an institution of the kind in question. Hence Mr. Iselin's remarks, at the close of his report, appear specially deserving of attention from large employers, and our wealthy and public-spirited City companies."

PUBLIC HEALTH AND THE WORKING OF SANITARY LEGISLATION.

At the seventh annual conference of Poor-law Guardians for the South-Eastern District, held at Reading on the 31st ult., Dr. Wells delivered an address on "Public Health, and the Working of Sanitary Legislation," dividing his subject into three heads,—1st. The habitations of the poor; 2nd. The removal of excreta from their homes; and 3rd. The supply to them of wholesome water. As regarded the first of these matters, he was afraid it must be admitted that in the majority of country villages the dwellings of the poor were neither conducive to health nor to morality. He quoted different authorities to prove the complete inefficiency of the present habitations of the poor, and remarked that the question for the conference to consider was the best mode of putting those dwellings into a healthy condition. A cottage for an ordinary family of the labouring class should be furnished with at least three bedrooms, though on some occasions two bedrooms might suffice. One sitting-room on the ground-floor should be laid with wood, as the brick or stone floors were not fitted for constant use, being under such circumstances injurious to health. The size of the rooms was as much a matter of importance as their number; for it was necessary to health that each inhabitant should be able to draw upon a certain number of cubic feet of air. To meet this requirement the rooms ought to be at least 8 ft. in height, and their cubical contents should be between 600 ft. and 900 ft. for bedrooms, and from 1,200 ft. to 1,500 ft. for the sitting-room. Then a proper change of air by means of ventilation must be provided. The facility of obtaining on necessary occasions a direct draught of air from one side of the house to the other was all important, considering how many generally occupied one room, and how much sickness might occasionally prevail in it. Windows should, therefore, open on both sides of a house. The formation of the windows themselves was of consequence. They should have sashes at the top, which was seldom the case, as well as at the bottom. Where these sash-windows could not be managed, a window swinging on a horizontal pivot was the next best arrangement, being superior to the old lattice. It was desirable, as much as possible, to avoid draughts, and a simple and well-known expedient for admitting fresh and getting rid of the effete air without creating unnecessary draughts, was by placing a plain flat board upon the sill of the window behind which the air came up into the room, and there were a hundred other plans for the same purpose. The roof should consist of tiles or slates in preference to thatch, and the walls of the apartments should not be covered with cheap papers, which harboured dirt and

insects, but so constructed that they might be washed with lime at periodical intervals. The means of improving or regulating the dwellings of the poor were much impeded by the fact that Rural Sanitary Authorities did not possess the same powers as those who presided over the health of towns. The power of making and enforcing bye-laws added immensely to the efficiency of all Boards of Health, affording a summary process of carrying out sanitary reforms; and there seemed no reason why Rural Sanitary Authorities should not possess such facilities. At present, all sanitary defects in existing houses in the country came under the head of "nuisances," and were to be dealt with under the 97th clause of the Public Health Act. It seemed very desirable that the rural authorities should be authorised to issue regulations respecting the proper construction of cottages, and to see that they were duly executed. Having thus obtained a properly-constructed domicile, they must endeavour to keep it in a healthy condition by a well-regulated removal from it of the refuse and excreta. The discharge-pipe from the sink should always empty itself outside the house, nearly 1 ft. above a perforated gully-plate. A trap should be placed under the plate to prevent the annoyance of foul smells in its neighbourhood, and the plate should be immovable by the inhabitants. It was necessary, in addition to trapping, also to ventilate the sewers by a shaft-pipe carried up above the eaves of the house, away from any windows, to discharge the foul gas. There were two principal modes of dealing with sewage, either of which might be adopted, according to the nature of the place and its surroundings—the one being the dry system, or earth closet, the other the water-closet system. One point it was absolutely necessary to bear in mind, whichever might be adopted, namely, all fœcal matter should be removed from the premises very speedily. In a well-ordered village, where the earth-closet system was adopted, a scavenger should be appointed to attend to the earth closets.

With reference to the supply of wholesome water to the houses of the poor, he said it had been estimated that 75 per cent. of the wells in the villages were more or less contaminated by sewage; out of 429 samples from different wells 307 were unfit for drinking purposes. The local authorities, rural as well as urban, appeared to be empowered to guard every cottage from impure water, and to require houses to be supplied with good water, if it could be furnished at a cost not exceeding two-pence a week. It was much to be wished that the question should be taken up by the Rural Sanitary Authorities, who were empowered to construct and maintain waterworks or dig wells, to hire or purchase any waterworks, or to contract with any person for a supply of water for their district or any contributory place therein. Where other sources of supply failed, recourse might always be had to the rain water collected from the roofs of the buildings or upon properly-prepared gathering-grounds. The average rain-fall for England and Wales was about 32 in. in the year. An inch of rain falling on an acre of ground realised 22,600 gallons, so that the total amount of rain during the year was 27,019,632 millions of gallons, and yet poor people in a dry season could get no water. It had been calculated that at present two gallons of water a head was all that was consumed in the day in a cottage, whereas from 10 to 25 gallons for each person for all purposes was the smallest quantity which should be provided.

Mr. Garland advocated the compulsory adoption of the earth-closet system in all rural places.

CHAPEL, COLSTON'S ALMSHOUSES, BRISTOL.

The chapel to these old almshouses (erected A.D. 1691) has been altered and embellished, and made more fit for divine worship. The building in plan consists of a rectangle, 24 ft. long by 18 ft. wide, and formerly had a flat lath-and-plaster ceiling, 16 ft. 6 in. from the floor. As the chapel is situated in the centre of one side of the quadrangle, with the almshouses flanking it, there are only windows at the east and west ends, the entrance being at the latter. The only interesting and architectural parts of the structure, *i.e.*, the high wainscoting round the walls, the angle pilasters, &c., and the oval west windows, have been preserved. The flat ceiling has been replaced by a semicircular wagon-headed one, with moulded ribs, forming panels and a carved cornice. A circular window, with Renaissance tracery, has been inserted in the east gable, and filled with painted glass by Messrs. Joseph Bell & Son, of Bristol, the subject in the centre being Colston distributing alms. The lower west windows are glazed with cathedral rolled glass in ornamental lead quarries. Oak stalls and altar-chairs, with altar-table and lectern, have been added, and a floriated cross to the east end. The floor is laid with polished parqueterie. One of Porritt's underground stoves warms the chapel. The works have been carried out by Messrs. Stephens & Bastow, builders, of Bristol; Mr. Honey, clerk of works to the cathedral, acting in the same capacity here. The cost has been about 350*l.*, which has been met by the Society of Merchant Venturers. Mr. Edmund B. Ferrey was the architect.

PARISH CLAIMS FOR ROAD-MAKING.

At Hammersmith Police-court, last week, Mr. Edmund Tattersall, of Coleherne Court, West Brompton, appeared to answer a second summons, taken out by Mr. Harding, clerk of the Kensington Vestry, calling upon him to pay a large sum towards the roads, &c., of Redcliffe-gardens, under the compulsory powers of the Metropolitan Local Management Act.

Mr. Hewitt, from the office of Messrs. Pontifex, solicitors, supported the summons; Mr. Bosanquet appearing for Mr. Tattersall.

It appeared from the evidence that Coleherne Court, house and grounds, abutted on Redcliffe-gardens, which were formed by the owners about ten years ago, partly on a parish footpath, known as Walnut-tree-walk, connecting the Fulham-road with the Richmond-road, Earl's Court. The owners paved the whole length of the road with the exception of that part abutting on Coleherne Court, which was left untouched up to the centre of the street. The vestry, in their resolution to pave that part, dealt with the whole length of the road; but the apportionment made by Mr. Weaver, the surveyor, was confined to one section only, not any of the expenses being apportioned on the other. The total amount of the apportionment was 350*l.* 19*s.* 7*d.*, 289*l.* 15*s.* 7*d.* of which were assessed on Mr. Tattersall. The first summons, which was dismissed, was for the estimated cost of the paving; the present summons was for the actual cost.

Mr. Bosanquet cited the case of "Whitchurch *v.* The Fulham Board of Works," in support of his argument that the Vestry were wrong in apportioning the expenses upon a section of the road only. His second objection was that it was not an apportionment, but an assignment to each house.

Mr. Bridge said his impression was that it was not an apportionment within the meaning of the Act of Parliament. The fairest thing would have been for the owners of the houses to have paved the whole street throughout. He then dismissed the summons.

The real point, as it seems to us, has scarcely obtained that recognition we should have expected. Walnut-tree-walk is an ancient parish way, next Mr. Tattersall's garden-wall, and has been repaired by the parish again and again. How can it be deemed a new road, which condition is necessary in order to make him liable? The widened way, like the old way, is used by the public and not by Mr. Tattersall, except as one of the public if he wish to go south. If the parish should ultimately succeed in so framing their case as to compel the defendant to pay the large sum of money claimed, it will be one of a series of injustices to which individuals have been subjected under the same clauses of the Metropolitan Local Management Act.

ST. NICHOLAS, SEVENOAKS.

Sir,—In your notice, under the head of "Church-Building News," of my report on St. Nicholas, Sevenoaks, last week, there is an error in quoting from my history of the church which I think it worth while to ask you to correct. Instead of saying, as quoted, that "the interior of the *church* was entirely reconstructed in the fifteenth century," I said "the interior of the *chancel*," which is very different. I should be sorry that any one who knows the church should suppose it possible that I could make such a blunder, and for this reason I write.

Ewan Christian.

TOWN IMPROVEMENTS AT WOLVERHAMPTON.

The town council of Wolverhampton are about to carry out extensive street improvements, for which they have purchased a large amount of property, and they have also decided to adopt the Artisans' Dwellings Act. This subject was discussed at a meeting of the council held last week, when Mr. Butler, one of the members, remarked that the prospect of the adoption of the Act was already diminishing the number of artisans' dwellings, whilst, in consequence of its not paying to put up such dwellings on the present plan, a great difficulty was arising, which might be met if the corporation would, as an experiment, erect blocks of buildings to be let out in groups of rooms on the new principle, and then, if the plan succeeded, doubtless private persons would come forward and build such dwellings. Several other members expressed themselves in favour of the suggestion, observing that there was a great deficiency of house accommodation in the town for the working classes. On the other hand, the ex-mayor expressed an opinion to the effect that the artisans of the town, having been accustomed to single and complete houses, would not take to such general dwellings as those suggested. Another member (Mr. Hill) protested against the corporation turning house builders and owners. In answer to a question as to the provision to be made for those whose dwellings were about to be demolished by the adoption of the Act, the town clerk said that the Act required the corporation to provide land on, or adjacent to, the condemned area, on which dwellings could be erected, before they pulled down the dwellings within the area, and there was plenty of land available in connexion with the improvement in question.

CHURCH BELL FOUNDING.

The bellfounders of the metropolis have of late years been well employed, consequent on the rapid increase of new churches, and some delay has to take place in executing orders.

A new foundry has been successfully commenced at Bideford, in the county of Devon, at some expense.

Recently, the first peal of church bells were cast for the ancient Church of St. Mary, Bideford. In order that the work should have no hitch, the founders, Messrs. Abbot, have had constructed on the premises a framework of well-seasoned oak, with all necessary tiebolts and stays, and the bells are first hung here for trial, prior to fixing them permanently in their proper places.

The old bells of the church had got cracked and out of tune, being cast in 1722, by the old bellfounder, Abraham Rudhalls, of Gloucester, a descendant of a family whose bellfounding dates back to the time of Henry VIII. The process has not greatly deviated from that period. At present the first necessary thing is to decide what note the new bell shall be. Resort is also had to mathematics, for by calculation alone are the relative sizes, &c., obtained. Having arrived at the proper form and dimensions, a mould corresponding with them is produced in sand prepared for that purpose, and placed in iron cases. The alloy of metal for casting bells is made from selected copper and tin fused together in a furnace of special construction. Where expense is no object silver may be employed, which adds to the mellowness and sweetness of tone. When the alloy is thoroughly and effectively made it is run into ingots, which are again melted in the bell-furnace. When the metal has arrived at a proper state of fluidity for running, the aperture in the furnace is opened, to allow the molten metal to flow into the channel communicating with a large cup or vessel made of a refractory material, and under which, in a pit, is made the mould for the bell. When, in the judgment of the workman, a sufficient quantity of metal has run into this cup, he withdraws a plug, and the liquid mass descends rapidly and silently into the bell-mould. The above is the *modus operandi* in this new foundry.

As a rule, the pitch of a bell is higher the smaller it is, and when a less quantity of metal is used than is due to the calibre of the bell, although giving the same note, a harsh, instead of a mellow, rich tone is produced. Hence the superiority of some of the old bells over those of modern construction, where economy has been of more consideration than correctness of tone.

The old tenor of Bideford Church,—weight,

1,606 lb., cast 1722,—had the well-known inscription on it,—"I to the church the living call, and to the grave do summon all." The inscription on the new treble just cast is,—"Let everything that hath breath praise the Lord. Praise ye the Lord.—Ps. cl."

GOLDINGTON HALL, BEDFORDSHIRE.

This interesting old English home is being thoroughly restored for the Misses Harvey, under the superintendence of Mr. John Day, architect, of Bedford. Mr. Day's designs not only embrace a thorough restoration of the old work, but very extensive additions; the whole being in accordance with the Elizabethan character of the old work. The greater part of the main front is old work; a new wing, however, has been added to one end. The grouping of the new portions in the garden front especially is picturesque. The dressings are of Bath stone, whilst the walls generally are of red brick interspersed with diamond-shaped bands of similar material, but of a darker hue. The roofs are covered by red warm-looking tiles of pleasing tint. In the interior, the ceilings are of a deeply-recessed panelled oak work, the ribs being richly moulded. A carved oak mantelpiece in the hall is a notable feature. It is carried right up to the ceiling, and exhibits a wealth of carved and moulded work. The massive oak staircase is similarly treated, and is terminated upon the floor above by an open oak screen of carved work, also reaching up to the ceiling, and forming an arcade. The carved work in wood and stone is from the chisel of Mr. Harry Hems. The contract for the whole of the works generally at Goldington Hall is being carried out by Mr. Spencer, builder, Bedford, under the immediate supervision of the architect.

WINCHESTER SCHOOL OF ART.

This institution, accommodated for the past two years in the Close by the dean and chapter in one of their houses, has now entered on a new existence, so far as its habitation is concerned, the ratepayers having been taxed to build a new school close to the Guildhall, where Mr. Stopher has designed and supervised the erection of a building which is a bolder example of Gothic than the Guildhall. The cost of the building has been upwards of 2,000*l.*, and even allowing for the small sum furnished by the authorities in London, the ratepayers will incur at least this, if not a larger sum. The materials used in the new building are flint and stone, and the subjects of the caps of the columns, &c., taken are from local botany. The builder was Mr. Macklin. The opening of the school and the exhibition of the "works" of the students, and the presentation of the prizes, took place on the 3rd inst., the duty being undertaken by the Earl of Northbrook. The interior of the new building includes in the basement a public reading-room and attendant's apartment, and upstairs are the "school,"—a panelled-ceiled room, some 60 ft. by 30 ft., and of proportionate altitude, divisible into three by curtains,—a ladies' retiring-room, a curator's room, &c.

The committee report that Mr. J. H. Tunmer has been appointed master, in the room of Mr. C. M. Clarke.

NEW FREE LIBRARY AND MUSEUM FOR DERBY.

Six years ago, last May, a public meeting of the ratepayers of Derby was held in the Guildhall, at which it was unanimously decided to adopt the Free Libraries Act of 1855. A Free Library Committee was formed to give effect to the wishes of the ratepayers, and an arrangement was shortly come to, by which the County Library, with its extensive premises in the Wardwick, together with a large collection of books, and the existing contents of the Museum, were transferred to the town for the purposes of the newly-established institution. To this nucleus was added a large assortment of modern standard works. So largely was the Free Library made use of by the inhabitants of the town that it soon became manifest that the premises in the Wardwick were structurally inadequate and unsuitable for the purposes of the institution. The want became known, and Mr. Bass, M.P., the senior member for the borough, with his usual generosity, made an offer to give a sum of from 4,000*l.* to 5,000*l.* for the erection of new premises for the Free Library and Museum. The offer was at once accepted with thanks by the Council, and, after some delay,—necessitated by the desire of all parties to obtain the best available site in the town for the new institution,—the present Free Library premises in the Wardwick were purchased. Plans for the new building were then advertised for, and that which found most favour with the committee was the design of Mr. R. K. Freeman, of Bolton. Mr. Bass approved of the choice of the committee, who, however, candidly informed the hon. gentleman that the carrying out of Mr. Freeman's plan would cost,—not 5,000*l.*, but a good deal over 7,000*l.* Mr. Bass at once said that he should have great pleasure in increasing his gift to 8,000*l.*, and that is now the amount at the disposal of the committee for the erection of the new building, which is estimated to cost about 7,600*l.* The new building will stand in the Wardwick, on the site of the old Library. The plan is as nearly as possible a square.

The style of the building is Early Gothic. The front elevation has the entrance-hall carried up as a tower with octagonal angle piers, finished with open timber turrets. The central part of the tower is also of open timber work, surmounted by circular roof. The wings have the roofs hipped back, and the ridges finished with wrought-iron ridge-cresting and finials. The space between the tower and wings is arcaded in both stories, but in general treatment it is subordinated to the more important parts of the design. Large oriel windows, with splayed angles, are placed in the wings, and a circular one is over the main entrance.

The exterior of the building will be faced with Derby pressed bricks, with moulded strings, arches, &c., of Coalville bricks. The dressings, oriel windows, turrets, &c., will be of Stourton stone. Terra-cotta, specially designed, will be introduced in panels and other places.

The staircase, corridors, steps to front entrance, &c., will be of Hopton Wood stone, polished. The roof will be covered with strawberry-coloured Broseley tiles. The glazing of the windows and screens in the principal parts will be of cathedral glass, of different tints, in lead lights, arranged in geometrical patterns. The internal joiners' work will be of yellow deal, painted. Special attention has been paid throughout to thoroughly efficient lighting and ventilation. The contract for the whole of the works has been let to Messrs. Woods & Son, of Blackburn, the amount of their tender being 7,600*l.* Mr. R. K. Freeman, of Bolton-le-Moors and Derby, is the architect.

PROPOSED AQUARIUM AND WINTER GARDEN FOR TORQUAY.

A scheme has been proposed at Torquay for the erection of a winter garden, aquarium, and skating-rink, upon the site known as the Braddons, on the Babbicombe-road, between the post-office and the museum. According to the scheme,—now in the hands of the "Torquay Aquarium, Winter Garden, and Skating Rink Company,"—the grounds are to be laid out in an ornamental manner, with walks, promenades, and skating terraces. There will be two distinct buildings upon the ground,—the aquarium and winter garden, and the skating-rink, the latter of which will be capable of conversion into either a closed or an open-air rink. The winter garden and aquarium building will be of Italian type, having a frontage on the Babbicombe-road of 320 ft., and standing behind terraces some 40 ft. above the level of the road. The first division entered will be 40 ft. square, and will probably contain six tanks round the sides and a large fountain in the centre, over which will be a glass dome. Going straight through the winter-garden portion, which will run the whole length of the building, the next division entered will be 70 ft. long by 40 ft. wide, and will contain large tanks and beds along the sides, with three octagonal ones down the middle. Next will come a large concert transept, which, including the stage and dressing-rooms, will be 110 ft. long by 55 ft. wide, and at the back of this transept will be waiting-rooms and an entrance-lobby. Crossing the transept two divisions similar to those first passed through will be entered, the last having a dome and fountain. The main dome of the building will be over the concert transept. To the right of the two last divisions of the winter garden will be a refreshment-room, large dining-room, and a complete suite of ladies' rooms; service-rooms, kitchen, larder, and store-rooms being farther back still. Leading out of the second division of the winter garden, on the right, will be the entrance to the tank section, which, exclusive of a large corridor at the back, will measure 120 ft. by 75 ft., and will contain thirty-one tanks placed in two sub-divisions, one being set apart for fresh water and the other for sea fish. The basement of the building will contain huge reservoirs for both salt and fresh water, and will hold the heating apparatus. The second floor will be set apart for science and art.

The cost of the scheme is estimated at about 30,000*l.* The plans have been prepared by Mr. John Watson, architect.

CAVENDISH COLLEGE, CAMBRIDGE.

The proceedings connected with the opening of the new Cavendish College, Cambridge, took place on the 26th ult. The ceremony was performed by the Duke of Devonshire, Chancellor of the University, who laid the foundation-stone of the building, which is situated opposite what is known as the road to Linton, about two miles out of the town. This is but the first block of a building that is to accommodate 300 students. At present only about 70 of that number can be received. The plan of the portion erected is cruciform, 110 ft. from east to west, and 70 ft. north to south. The building is four stories high, and in addition to apartments for students there are tutors' rooms. On the ground-floor, which is 14 ft. high, there are rooms in common, 14 ft. by 25 ft.; dining-hall, 46 ft. by 18 ft., with central hall, &c. The style of architecture is Tudor, and the material used is red brick with stone dressings, covered with Staffordshire tiles. The space of ground purchased is about ten acres, and the company by whom the college is built have done their utmost to secure the comfort and health of the residents. The work has been entrusted to Messrs. Giles & Gough, of London, architects; and Mr. Thoday, of Cambridge, is the builder. Concerning the objects of the college, the main feature of the institution is to place a University education within the reach of those who are obliged to commence the active work of life at an earlier age than ordinary undergraduates.

STREET IMPROVEMENTS.

In consequence of the opening of the new and broad throughfare, Fitz-John's-avenue, from the top of St. John's Wood, across the Conduit-fields to Hampstead, it has been found necessary to improve the access to it from the High-street and Heath-street; and the Hampstead Vestry have now before them three plans for the carrying out of this scheme practically. Two of these plans would involve the widening and partial demolition of Perrin's-court and of a portion of Church-lane at a cost of from 11,000*l.* to 14,500*l.* A third scheme has also being laid off before them for the continuation of Fitz-John's-avenue and the Greenhill-road by a gentle and graceful curve to the bottom of Heath-street, thus making one continuous thoroughfare from St. John's Wood up to the top of the Heath itself, near "Jack Straw's Castle." This thoroughfare, it is estimated, would cost about 45,800*l.*, out of which upwards of 21,000*l.* could be realised by the sale of the freehold land not actually required. Each of the two first-named plans shows an estimated increase of about 850*l.* upon the annual rateable value of the property as it now stands; but the third scheme, if carried out, would raise the rateable value from about 1,700*l.* to upwards of 3,550*l.*, or about 60 per cent.

Some months ago it was resolved by the Metropolitan Board of Works to widen the Harrow-road, by which access is obtained by omnibuses and other traffic from Paddington-green to the Edgware-road. In consequence of that resolution, notices were served in due course on the occupiers of all houses on the north side of the road, who, within the last week or two, have made an exodus in the wholesale, and on the 6th inst. Messrs. Horne, Eversfield, & Co. offered for sale by auction the vacated premises as building materials. The first four houses on Paddington Green also are to come down along with the rest, and a like fate, within the course of the next week, awaits the small, crowded, and gloomy tenements in the rear of the houses in Harrow-road, known as Lion-passage, White Lion-place, Vine-place, and Alfred-place. Among the houses which will disappear are the old inn bearing the significant sign of the "Horse and

Sacks," reminding us of the old days of pack-horses, and also "Paddington House," at the south-east corner of the Green, a mansion which was built by a citizen of London, who retired with a fortune to that rural quarter in the reign of Queen Anne.

The road will be thrown back about 20 ft. or 30 ft. all the way, and new shops of an imposing appearance will be erected on the site of the buildings now about to be demolished.

NORDEN'S MAP OF LONDON.

Sir,—I think the last paragraph in the article on Old London, in last week's *Builder*, is unjust to the memory of Norden, for there is no reason to believe that Van den Keere did anything more than engrave the map, and Norden allowed him to take all credit due to him. Norden seems to have been a very painstaking surveyor. I suspect we had no engravers of sufficient skill in England to do Norden's work, and that he was forced to send it to Holland for engraving, just as we had to import types in old times.

Henry B. Wheatley.

*** The opinion expressed in the article referred to is supported by the map itself. In connexion with the references, Norden's name appears, printed, not written; and as thus:—"Joannes Norden Anglus *descripsit*, anno 1593." Norden sold the map, without doubt. In the left-hand corner of the map is "Pieter Van den Keere, *fecit*, 1593"; and from the mode of engraving it has evidently been done by the original draughtsman of it. If further evidence be wanting, it is in the name-writing of the streets, &c.

"A PIECE OF LIMESTONE."

This was the title of the fifth of a course of "Gilchrist Lectures," delivered by Dr. Carpenter, on the 1st inst., at Halifax.

Dr. Carpenter said that, in his last lecture, he had showed how the surface of the earth had been altered by glaciers; but he had now to speak of the manner in which a portion of the crust had been built up. In England,—that little corner of Europe,—they had almost a complete set of the beds of stratification, which had done much to aid geological science. Limestone, he believed, did not crop up near Halifax. They had at Halifax chiefly millstone grit. Carboniferous limestone was the basin of the coal producing strata. There was a strong reason to suppose that the different coal-basins in England were originally one vast tract; but had been crumpled up into basins by upheavals. The carboniferous limestone was the limestone of the greatest thickness. The question he had to bring before them was how limestone was formed. They found that beds of limestone were intercalated among other beds. The wearing down of granite gave them sandstone from the quartz and clay from the feldspar; but limestone was not formed in that manner. The general doctrine of all geologists now was, that limestone was formed by animal agencies,—the accumulation of the shells of animalculæ, which obtained the carbonate of lime of which their shells were composed from the water in which they lived. Chalk, whiting, limestone, marble, were all different forms of carbonate of lime. Marble was carbonate of lime in a crystalline state. Carrara marble was an oolite, or like Bath-stone or Portland-stone. It was of this marble that the most beautiful statuary was formed. The beds of Carrara marble might be traced in a line to the other oolite beds in Europe; but the Carrara oolite had undergone a metamorphosis by volcanic action, which had changed it into marble. The section of the carboniferous limestone near Bristol showed that it was about 2,500 ft. thick. They found that these limestones were almost entirely composed of fossil shells. Professor Hull, at the head of the Irish survey, showed that where the limestone was the least disturbed the fossils were most numerous, and where it had been greatly disturbed there was the least number of fossils preserved. They found that heat and pressure were sufficient to produce a crystalline limestone. All limestones were directly or indirectly the production of animal life. One indirect manner was where rocks were formed by the wearing away of coral rocks. The lecturer then pointed out the different beds of limestones. In the Laurentian, of which they had an instance on the west coast of Scotland—and he had been referred to as an authority on the subject—he found distinct traces of animal life. Then there was the great thickness of the gneiss, which was altered limestone. The oolite was a limestone composed of shells, corals, &c. Oolite really meant egg-stone, from the shape of the grains of which it was composed. The numulitic limestone was so called on account of the appearance of the fossils, which were about the size of a shilling. The Pyramids of Egypt were built of numulitic limestone. The limestone of which the buildings in Paris were composed was a modern limestone. It did very well for Paris, but it would not do for that purpose in England, on account of the acid which was contained in the atmosphere, which would decompose it. At the conclusion of the lecture a large number of limestone fossils were represented on the screen by the aid of the limelight, some of which had been dredged up by the *Challenger*. Dr. Carpenter pointed out in what beds the different fossils could be found, especially alluding to those that could be found in the lias near Saltburn, Whitby, &c.

THE STATUS OF ARCHITECTS.

Sir,—Among many professional brothers I am able to substantiate the truth of your correspondent's statement as to the position of architects.

The last of my small patrimony, some 450*l.*, was expended as a premium to place me in the *profession* of a gentleman with a London architect and district surveyor. At the expiration of my indentures, my master having become bankrupt, I struggled for some months to find employment, and ultimately entered the office of a valuer and surveyor, who was largely connected with a celebrated firm of civil engineers. After being four years and a half in this employment, I became architect to the latter; with them I remained, also, over four years. At forty years of age, with the professional experience of twenty-three years, I am now in an engineer's office with a salary of 2*l.* per week; and, but for literature and other assistance entirely independent of architecture, the tempting and discriminating offer of the Horse Guards ("To saddlers, architects, and tailors") might have saved the ratepayers of my parish from the burden of my support.

Whilst the work of an architect is attempted, I will not say performed, by those who have never been educated to the profession, any improvement in this state of things is scarcely to be hoped.

I have a friend who served his time to a *sanitary engineer*, and went straight from the office of his employer to the *architectural* department of the Horse Guards; he could not, of course, pass any examination, and, doubtless, went in as a so-called supernumerary. To such proceedings, and others of much less credit to the country, the occurrence I am about to relate is in all probability due.

A barrack was built in India, and after its completion was found to be unfit for its purpose: this was a small matter compared with the sequel. The barrack was pulled down, the materials were sold, and the architect (?) (a Royal Engineer) bought back from the brother of the purchaser the identical stone of which it was previously built, not knowing, we will hope, that it was the same.

Civil Engineer, late Architect.

"SKILLED AND UNSKILLED WORKMEN."

Sir,—Having seen a letter in the *Builder* (p. 1079), from "Inquirer," in reference to the "Mysteries of the Building Trade," I wish to make a few remarks applicable to the subject.

As to the great diversity of opinion which exists at the present time in the trade, nothing more fully confirms it than the vast difference in the amount of the tenders for the same job; and while the system of paying skilled and unskilled workmen the same amount of wages remains in force, it is a matter of impossibility for any employer of labour to form a correct estimate as to the cost of the work he is about to undertake.

A few evenings ago I was in conversation with a very intelligent foreman, whom I believe to be a most valuable servant, and who is now superintending the construction of a large building in the south-western district. He told me that his employer gave him orders if he saw any workman under his charge was worth more money than he was receiving, he was to have it, for those were the kind of men who paid him best; and it is well known that well-paid labour is the cheapest of labour, when judiciously managed; and if skilled workmen do not receive a wage in proportion to their work, it takes all the stimulus from them to improve themselves.

The following argument is sometimes raised, that it would be imprudent to make a distinction between the first and second class workmen, on account of the dissatisfaction it would create in the trade; but if those in charge of the work were competent to distinguish between the two (which they should be), the difficulty would be no greater than in any other trade; but when we see skilled hands discharged to make room for inferior ones, and the latter are paid as first-class workmen, we must still expect to hear employers exclaim "This work is costing too much"; and where such a state of things exists it forms another mystery in the building trade, which an outsider might well be puzzled to understand.

A Looker On.

TRANSMISSION OF SOUND.

Sir,—The partition described by your correspondents, Messrs. T. Robinson & Co., is as well calculated as possible to transmit sound from one room to the other. It consists of two faces of sonorous boarding joined together by the studs of the partition framing, and is covered with varnished paper, which will greatly facilitate the reception and the delivery of the sound at the two surfaces. With such construction the filling of the air spaces with sawdust can be but of small avail. The simplest remedy would be to canvass one or or both of the sides again and hang with a heavy flock paper so as to deaden the sound as much as possible by means of the soft rough surfaces. As an experiment some rough material might be tacked to each side of the partition so that the effect could be observed.

Thos. Blashill.

CHALK FOR BUILDING.

Sir,—I see one of your correspondents asks for information respecting the treatment of chalk for building purposes. Perhaps it may be a help to tell him that on the top of Wrotham-hill there are two cottages, the walls of which are built entirely of chalk. They stand close to the high road leading from London to Maidstone, and have been built at least thirty years. There is another cottage at Wrotham Chalk-pits, occupied by a workman in the employ of Mr. Spencer, lime-burner, Wrotham, Kent, who would possibly give your correspondent, "Z. W.," the information he requires.

S. T.

THE SOCIETY OF ARTS.

Sir,—Seeing that a series of Saturday evening lecture on the Laws of Health were to be given at the Society o Arts rooms, by a gentleman who is believed to have considerable theoretical and practical knowledge of the subject, I went to hear the first one on Saturday last, and on arriving at the time when the lecture should have been commenced (eight p.m.), found the entrance-lobby blocked by a number of persons, all, like myself, desirous to enter, but detained apparently in order to carry out the slow process of each one separately signing his name in a book. Having waited for some minutes in the very draughty lobby, I came to the conclusion that a lecture, where things were managed in such an unbusinesslike manner, was not worth the trouble.

Is it a "Shibboleth" of the Society that no one can enter its dreary and comfortless rooms without first writing his name? I can understand the ceremony at a members' meeting; but when a lecture is publicly advertised, with a money charge for admission, one would suppose that the payment of the stipulated coins should be sufficient, without requiring from every one of a crowd of persons a specimen of his caligraphy.

Hygiene.

TILING.

Sir,—I should be very much obliged to some of your correspondents if they could give me, through your columns, an opinion as to the best manner of putting tiles on a house,—first, so as to avoid snow and rain driving in; secondly, for warmth; thirdly, for durability. I have put them on with hay, with felt, boards, and mortar, without perfect success, and now my clerk of the works recommends *moss* (which I never heard of before), while my foreman recommends mortar, and then lathing the rafters, and putting on them inside a rough coat of plaster.

G. Horsley Palmer.

The Theatre Royal, Southampton.—This building has just been decorated by Messrs. Buchan & Son, and the orchestra having been removed to underneath the stage, has given much more room, whilst a new retiring-room for ladies has been built on the ground-floor.

ABERDEEN CITY IMPROVEMENTS.

A SPECIAL meeting of the Aberdeen Town Council was held lately for the purpose of considering three new schemes of improvement. One of these is the utilisation of the sewage of the town for the purposes of irrigation. At present the sewage of the more lowlying parts of the city discharges itself into the harbour, and the proposal is to pump it up, so that it might be used for irrigation purposes, along with the sewage from the higher lands, which is at present utilised on the Spittal Irrigation Farm. The subject was remitted for report to Mr. Boulton, the police surveyor, who details two schemes for the diversion of the low-level sewage, and the junction of it with the high-level system as desired, the total cost of the one being 31,221*l.*, and the other 29,540*l.* The annual expenditure for pumping of the first-mentioned scheme would be 1,000*l.*, as against 500*l.* in the other case; but Mr. Boulton recommends the more expensive scheme as the "best and most satisfactory under all the circumstances." In order to properly utilise the sewage, if the proposal is carried out, Mr. Boulton thinks that about 624 acres of land would be required, 216 acres near the south side of the Don for the sewage of the 27,000 inhabitants residing in the district drained by the mid-level sewer, and 408 acres at Murcar for the 51,000 inhabitants in the district drained by the low and high level sewers.

Another scheme is the opening up of Rosemount, or, in other words, the connecting of that important suburb, which lies at the north-west corner of the town, with the city. It is proposed to bring the district into closer connexion with the business part of the city by the construction (1) of a new street, commencing at the High Stocket-road, nearly opposite Watson-street, passing thence through the property recently acquired by the Town Council to Upper Leaside-road, and running thence across the Den Burn to Skene-street, which it would join nearly opposite Chapel-street; and (2) of a street running in a straight line from the north end of Union-terrace to the foot of South Mount-street, and including the opening up of the north end of Union-terrace into Skene-street. The estimated cost of the last-named street is between 13,000*l.* and 14,000*l*, but no estimate of the other street has yet been made known.

The third scheme is the construction of a carriage-drive along the north bank of the river Dee.

The Improvement and Sewage Committees, having fully considered these schemes, have recommended that the Council should make application to Parliament in the ensuing session for a new Improvement Act, which, in addition to these three schemes, might enable them to effect several minor improvements.

The Council discussed the report of the committees at great length. The whole of the speakers were in favour of an Improvements Bill being obtained, but eventually the report was held over for further consideration.

THE RUINS OF IONA.

THE *Oban Times* details the "improvements" that have been made by the Duke of Argyll at the grand old ruins that adorn the Island of Iona. Among the most important of these have been the opening and repairing of the east window, north and south windows of the choir, and south window of the transept, and restoring them to exactly their original style. All the walls right round the cathedral and monastery, wherever there were any flaws, holes, or cracks, have been carefully repaired, and the original foundations laid bare, and where any defects existed they have been made good with stone and cement. All doorways and windows which had been decaying have been secured, and the old patterns been adhered to. The chapter-house, which is the only part of the building that has a roof to it, and which was in a very ruinous condition, has been thoroughly overhauled. Tons of earth and rubbish were taken off the top of it, and replaced by good lime, stone, and cement. In the cloister court great improvements have also taken place. Some beautifully-carved pillars were exposed in excavating the court; they formed the sides of a series of little doors which led into the square from the court. They are now carefully preserved as being good specimens of work. Some very fine tombstones have also been brought to light, the last of them being that of M'Duffie, or M'Phee, of Colonsay. This stone is below the east window of the south aisle, and has an inscription upon it, although much broken, and is considered to be as fine a tombstone as there is in the island. The inscription has been read by Mr. James Drummond, Edinburgh. There has also been a heart-shaped stone, with a cross on the face of it, found some few hundred yards north-east of the cathedral. It is very carefully preserved in a strong iron box with lock and key specially made for it, by the orders of the proprietor, his Grace the Duke of Argyll. It is supposed by him and other antiquaries to date as far back as the time of St. Columba. Another of the same shape, with a cross also upon it, has since been found near the same place.

TENDERING AT SALFORD.

EARLY in September of this year the Salford Corporation solicited tenders for the construction of a reservoir at Highfield. The specifications were announced in the advertisements to be ready on a certain day, but for some reason or other they were not issued until some days afterwards. In each specification it appears that the words "white bricks" had been printed instead of "red bricks" or "hard-burnt bricks." The moment that this "mistake" was noticed, the word "white" was crossed out, and "red" or "hard-burnt" written over. Thus each contractor was treated precisely alike in the correction. On the 15th of September their respective tenders were opened by the Water Committee, and found to be as follow:—

M'Gregor & Badman, Darwen	£11,867	0	0
G. Lawson, Northwich	11,424	0	0
W. & J. Worthington, Manchester	9,611	0	0
A. Pilling, Bolton	9,237	9	3
J. B. Maguire, Lancaster	8,644	13	3
King & Hawn, Wigan	8,480	0	0
G. Gilbert, Salford.....	8,454	0	0

The estimate of the borough engineer was 8,182*l.* The consideration of these tenders was deferred until the 20th of September, when the committee selected for consideration the lowest three; and, nine days afterwards, on the 29th of September, they again met, and had a letter read to them from Mr. Pilling to the effect that he had estimated for "white" instead of "red" bricks, and that, therefore, his amended tender would be 1,144*l.* 5s. 4d. less than his first tender, *i.e.*, 8,093*l.* 3s. 11d. instead of 9,237*l.* 9s. 3d. On the 11th of October the committee again met for further considering the tenders, when they decided to accept "conditionally" that of Mr. Pilling. That gentleman having complied with the "conditions," this decision was confirmed by a meeting of the same committee on the 23rd of October, when it was ordered that the Council should be recommended to approve of their proceedings and accept the contract.

These facts coming to the knowledge of Mr. Councillor Dyson, he was in his place at the Council meeting on the 30th ult. to make inquiries in regard to them; and, upon Mr. W. Brown's motion for the confirmation of the Water Committee's minutes and the acceptance of Mr. Pilling's tender, he put the following questions to the chairman of that committee, viz.:—First, how was it that the specifications were not ready till the Wednesday evening or Thursday morning, instead of the Monday, so that only two or three days were given to the contractors in which to prepare their tenders? Second, how was it that Mr. Pilling's specification said "white bricks" and all the other specifications "hard-burnt bricks," "white" being crossed out? And, third, who informed Mr. Pilling after the second meeting of the Water Committee, called for the purpose of opening the tenders a second time, that he had made a mistake in tendering for "white bricks" instead of "hard-burnt bricks"? Why was Mr. Pilling allowed a third chance of tendering and the other contractors only two chances?

In reply, Mr. Farmer, chairman of the Water Committee, admitted that what was done in the matter of Mr. Pilling's tender "was entirely at variance with his ideas of what was fair and right"; and, in thus expressing himself, he was not alone; others took the same view, and the matter was referred back to the committee for further consideration, with the intimation that they will do well to cast aside the whole of the estimates and begin *de novo*. The *Salford Weekly News* asks how it was that Mr. Pilling alone, of the seven firms tendering, should read "white" for "red" bricks, when the word "white" was crossed out of the specification and "red" written over it?

DRAINAGE AT BURSLEM.

THE Burslem Local Board at their last meeting considered and unanimously adopted a scheme prepared by their surveyor (Mr. E. M. Richards) for disposing of the sewage of the district by irrigation and downward filtration upon the Bradwell Hall Farm, situated about one mile north-west of the village of Wolstanton. The sewage, amounting to about 900,000 gallons per day of twenty-four hours, will be pumped through a cast-iron rising main, 1 ft. 4 in. diameter, to a vertical average height of 190 ft., and thence distributed over the farm. The farm, comprising an area of 314 acres, will be leased at an annual rental of 2*l.* 10s. per acre. The cost of carrying out the necessary works is estimated at 25,000*l.*!

MASTERS AND MEN.

Greenock. — The masons in the employment of Messrs. John Coghill & Son, Greenock, who struck work on account of an alleged infringement by their employer of the society's rules referring to apprentices, have returned to their work, the difference having been amicably settled.

Bradford. — The journeymen plasterers in Bradford are on strike. They wished to be paid "walking time," and to have two hours' notice before leaving, and the employers offered to pay the men by the hour, but they have been unable to agree as to terms.

Swansea. — The master-builders of Swansea, who, some months ago, during the strike of the operative masons, formed themselves into an association for mutual protection, have received notice from the Operative Masons' Association that in May next they should demand an increase of wages of 6d. a day. The Master Builders' Association have since met, and come to the unanimous conclusion to give notice to the men that on the 1st of January next they will reduce the wages 6d. per day, in consequence of the depression of trade and the state of the money market.

Liverpool. — The second annual *soirée* and ball of the Liverpool House Painters' Association was held on the 6th inst. It appears that during the past year there have been paid out of the funds of the Association about 378*l.*, as follows:—For deaths, 198*l.*; accidents, 116*l.*; benevolent purposes, 42*l.* 5s.; and travelling-money (to allow members to go to other towns), 22*l.* The number of the members is 1,456.

CLAIM FOR WAGES BY A BUILDER'S FOREMAN.

BARTLETT *v.* ROWLAND.

THIS was a claim (heard in the Bloomsbury County Court, on the 10th inst.) made by the plaintiff, a builder's foreman, to recover from the defendant the sum of 2*l.* 10s. for a week's wages, and 13s. 6d. petty cash; total, 3*l.* 3s. 6d.

The plaintiff stated that he was engaged by the defendant on the new buildings at the corner of Bolsover-street, Euston-road, and was paid up to the day before Good Friday. Had applied sixteen times to the defendant for the money due to him. He received a week's notice to quit on the Tuesday after Easter Sunday. The defendant told him he (the plaintiff) was superseded, and he wanted plaintiff to make up his accounts and measure up the excavations. He measured up, made up the time-sheet, and paid the men's wages; but on Saturday he was told he would not be paid until he brought a note from Rowland, and Rowland would not give him one. The defendant said he gave the notice to the plaintiff because he had no interest in the works, and the surveyor complained of the conduct of plaintiff. He never promised to pay plaintiff, but would have done so if he had made up his book. Judgment was given for the wages without the petty cash.

Skating-Rink at Rock Ferry.—A new skating-rink has just been opened at Rock Ferry, Liverpool. The site is central, being on the Bedford estate, adjoining the New Chester-road, and close by the Wesleyan chapel. The building is externally of a plain style of architecture, being built of brick with stone dressings. The covered and open rink together have an area of 750 square yards. The covered portion is roofed over by open timber, stained and varnished. The usual retiring-rooms are provided, together with a refreshment bar, and a gallery overlooking the skating surface. The sole contractor for the erection was Mr. W. Davies, of Nelson-place, Rock Ferry, and the architects were Messrs. Troughton & Prescott, of Cambridge Chambers, Lord-street, Liverpool. The floor was laid by the Manchester Limmer Asphalte Company.

CHURCH-BUILDING NEWS.

Seend (Wilts).—On the 7th inst. the Bishop of Salisbury re-opened Holy Cross Church, the parish church of Seend, on the completion of the rebuilding of the chancel, at a cost of nearly 1,000*l.* raised by public subscription, aided by a grant of 100*l.* from the Ecclesiastical Commissioners. The nave and aisles of this church were rebuilt in the latter half of the fifteenth century, and are good specimens of Perpendicular architecture; but the chancel which was "restored" early in the seventeenth century was quite unworthy of the church. It was, therefore, resolved to rebuild it on the old foundations, preserving those portions of the walls which belonged to the original chancel. The new work is constructed of Bath stone, the interior facing being of ashlar and the exterior of range work similar to that in the nave. The details of the windows, parapet and string-courses, and the carved pinnacles are copied from those of the north aisle. The roof, which is covered with lead, is of oak with pine panels. The prayer-desks, lectern, &c., are of carved oak, and the paving is of Minton's tiles. The brass standard lights and the altar-rails were cast by Mr. Singer, of Frome, from the architect's designs. During the progress of the work a "squint" was opened between the chancel and the north aisle, and a portion of a Norman shaft and some fragments of two Decorated windows were found in the walls. The architect was Mr. Arthur J. Style, of Thames Ditton and London; and the contractor was Mr. R. B. Mullings, of Devizes.

Newington (London).—The new church of St. Andrew, New Kent-road, was consecrated by the Bishop of London on the 8th of November. The building has been erected from designs of Messrs. Newman & Billing, and is of Early French type. The nave is 80 ft. long and 28 ft. wide, and 37 ft. to the plate, in five bays. The chancel is 28 ft. long, 23 ft. wide, and 31 ft. high. On the north side are nave and chancel aisles, and on the south side nave aisle, vestry, organ, transept, porch, and the baptistery, being the lower stage of the tower, vaulted with stone. The nave roof is open, and the chancel roof is a barrel vault in wood. The church accommodates 766 persons, and is free and unappropriated, the district being a very poor one. The font is the old one from the demolished church of St. Mary, Newington, of bad Late Decorated Design, about twenty years old, and only valuable from its associations, as it is very unsuitable to the new church. The church is faced with stocks internally, and externally with red brick, and stone bands and tracery, and cost 4,800*l.* The builders are Messrs. Dove, Brothers; the tiles are by Mr. Godwin, of Lugwardine; the heating by Mr. Eyre, of Codnor, Derby; and the lighting by Mr. Mason, of Harrow-road; the fittings are by Messrs. Jones & Willis; Messrs. Warner supplied the bell; and the builders' clerk of works was Mr. H. Buck.

DISSENTING CHURCH BUILDING NEWS.

Romford.—The foundation-stone of a new Congregational Chapel in South-street, Romford, was laid on the 5th ult. The new chapel is to replace an old structure in North-street, which was erected in 1823, and afforded accommodation for only 250. The architect of the new chapel is Mr. E. C. Allam, of Romford, Messrs. Staines & Co., of London, being the builders, the contract sum being 3,210*l.* In addition to this amount, the site cost over 1,000*l.*, and the total outlay is about 4,500*l.* The style adopted for the new chapel is Gothic, of an early and simple character. The building will be oblong in plan, 61 ft. long by 37 ft. wide internally, with a tower at the south-east corner, surmounted by a slated spire 60 ft. high. In the rear of the church behind the pulpit will be a large class-room, and over this the organ-gallery, with accommodation for the choir. In the front elevation will be a large four-light window, and beneath it the principal entrance; a smaller door on the left will give a separate entrance to the tower staircase. The side elevation will be divided into five bays by bold projecting buttresses with a large two-light window in each bay. The walls will be faced with Kentish ragstone, with dressings of Bath stone. The roof of the building will be semi-octagonal in form, or wagon-headed. The church will accommodate 340 persons on the ground floor and 130 in the end galleries, and, should further accommodation be required, side galleries can be added, giving 200 additional seats.

Kilmuir-Easter.—The new Free Church at Kilmuir-Easter was opened recently. The building was commenced in October last year. The architects are Messrs. Maitland, Tain. The length of the building is 68 ft. and the breadth 33 ft. The roof is open—29 ft. from floor to ridge, and is supported by five coupled principals, resting on stone corbels. The design of the roof is wagonheaded, with quatrefoil ventilators of pitch pine in the centre of each bay. The work has been all executed by local tradesmen, the following being the various contractors for the work:—Mason work, Messrs. D. Munro & Co., Alness; carpenter and slater, J. & D. Munro, Milntown; plaster-work, J. Reid, Tullich; painter work, Urquhart & Mackay, Tain. The church is seated for 500, and is in the Early French Gothic style. The cost is 1,500*l.*

Bridge End (Halifax).—Bridge End Chapel has been reopened, after being closed seven weeks for renovation and redecoration. The stencilled ornaments used in the decoration were specially designed for the work by the decorators, Messrs. Hirst & Barraclough. Mr. Thomas Bottomley has executed the woodwork in connexion with the alterations and additions that have been made.

Bury St. Edmund's.—The Baptist Chapel in Garland-street, Bury St. Edmund's, has been re-opened, after being closed three months for alterations, &c. Open benches have been substituted for the old-fashioned high-backed pews, and a new platform for the preacher, with baptistery beneath, has been erected. New sunlights have been provided by Messrs. Hudson & Jaggard. The painting work was done by Messrs. Mead & Neagus, and Mr. Lot Jackman was the builder, to whom the benching and renovating of the interior of the building was entrusted, under the superintendence of Mr. John Watson.

Cricklade.—The foundation stone of a new Congregational Chapel has been laid at Cricklade. For nearly eighty years past a Congregational chapel has stood in Calcot-street, Cricklade (it having been erected in 1799), but as it would seat only about 200, it has recently been thought that a more commodious and spacious building was desirable. Accordingly, Mr. Orlando Baker, architect, of Swindon, was instructed to prepare plans for a new chapel. The front wall of the old chapel has been pulled down, and the new building will occupy the ground in front, which has hitherto been used as a graveyard. It will be joined to that part of the old chapel which is left standing, which will form a schoolroom for the 150 scholars attending the Sunday school. The schoolroom will be divided from the chapel by a screen, removable at will. The new structure, which will cost about 1,000*l.*, will be 45 ft. by 30 ft., and, with the galleries, will be capable of seating about 450 persons. The contract for the masonry has been let to Mr. J. Pinnock, of Cricklade.

Chertsey.—The memorial-stone of a new Congregational Church at Chertsey has been laid. The building will be of red brick, with stone dressings. Mr. John Sulman is the architect, and Messrs. T. & W. Knight are the builders.

Rastrick.—The memorial-stone of a new United Methodist Free Church, at Oakes-green, Rastrick, has been laid. The estimated cost of the building is 2,000*l.*: it comprises a commodious room for public worship, a school-room beneath the same, two class-rooms, and a house for chapel-keeper: the style is Classic. The contracts are let to the following: masons' work, John & Wm. Crowther, Rastrick; joiners', Jonathan Charnock & Sons, Halifax; plasterers and slaters', Joe Wood, Rastrick; plumbers', John Shaw, Rastrick; painters', J. Stuttard, Huddersfield. The rooms will be warmed with hot air. The plans and designs are by Mr. R. F. Rogerson, architect, Brighouse.

Forfar.—A new Baptist Church has recently been opened at Forfar. The building has been erected from the designs of Mr. J. A. Johnston, architect, Forfar, and the total cost will be 1,700*l.* The site is in Manor-street, having a considerable frontage to the street. The building is of concrete, the execution of which, along with the painting, was taken in hand by the managers themselves, and these parts of the works have been carried out by their own *employés*. The structure is in the Early Gothic style. The chapel, which is seated for 400, is 56 ft. by 40 ft., and the height from floor to ceiling 25 ft. Behind the chapel is a hall fitted up to accommodate sixty persons. This is stated to be the first erection in Forfar in which concrete construction has been tested. The walls are 18 in. in thickness. The contractors were:—For the joiners' work, Mr. Hay; for plumbers' work, Mr. Howie; for slaters' work, Mr. D. Shepherd; for plasterers' work, Mr. Masterton.

Gateshead.—A new English Presbyterian Church is being erected in Gateshead, from designs prepared by Mr. J. J. Lish, architect, Newcastle. It will be a stone building, in the Gothic style, and will have a spire rising to a height of 150 ft. Seats will be provided for about 800 persons. The session-house, lecture-hall, and vestries are already erected at the west end of the chapel; and the total cost of the entire works will be between 6,000*l.* and 7,000*l.* The contractors are Messrs. White & Sproat, of Blyth, and Mr. Thomas Gibson, of Newbiggin-by-the-Sea. The ceremony of laying the foundation and corner stones of the church took place on the 13th ult.

Stoke-on-Trent.—The Congregational Church at Stoke-on-Trent has just been reopened, after alterations and improvements, and the erection of lecture-room, class-rooms, and other conveniences, at an outlay of about 1,000*l.* Mr. Sugden, of Leek, was the architect, and Mr. Barlow, of Stoke, the builder.

Liverpool.—The new Presbyterian church here is situate on the east side of Shaw-street, corner of Everton-brow, the principal façade fronting that way, the side elevation to Shaw-street. The street in front being a very steep gradient, a lecture-room was formed underneath, the floor of which is only 24 in. below the level of Shaw-street, thereby giving all the necessary light; there are also vestries and class-rooms. The plan of the church comprises a nave 67 ft. long by 33 ft. wide, and two transepts 15 ft. by 7 ft. 6 in. There is also a gallery over the entrance end 33 ft. by 17 ft., the whole filled with pews made upon the most approved principle, and all framed and filled with flush narrow boarding, providing seat-room for about 500. The ceiling is wagon-headed, showing all the wood ribs dressed and moulded, with a corbelled cornice at the spring and perforated space above that acting as ventilators. All the panels are relieved with stencil patterns in prominent colours. The whole was designed and carried out under the superintendence of the architect, Mr. Richard Owen, Breck-road, the contractors being Messrs. Nicholson & Eyre, Wellington-road, Toxteth Park. The total cost of land, building, and furniture, will be about 4,500*l.*

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Birkenhead.—Our Lady's Church, Birkenhead, which is situated near the northern extremity of Price-street, Birkenhead, has been erected nearly sixteen years, the foundation-stone having been laid on the 6th December, 1860, by the Roman Catholic Bishop of Shrewsbury. The cost of the building was about 6,000*l.*, but only the nave and aisles were constructed. Steps are, however, now being taken for the completion of the edifice, and the bishop has laid the foundation-stone of the chancel, which, with two side chapels, sacristies, and tower, will carry out in their entirety the plans of the architect, the late Mr. Welby Pugin. The tower will be 70 ft. in height. The contractors are Messrs. Woolley, of Chester. The material employed will be chiefly Stourton stone.

Market Harborough.—A new Roman Catholic church is being erected here near the Lubenham-road. The ceremony of laying the foundation-stone was performed on the 21st ult. by the Bishop of Nottingham.

Sutton.—On the 27th Sept. the new Roman Catholic Church of St. Edward, King and Confessor, was consecrated at Sutton, near Guildford. The church stands on an eminence adjacent to Whitmoor House, and is of plain exterior, in the Early English style. It is built of brick, faced with flint and stone dressings, and consists of nave, apsidal chancel, and north aisle, forming the lady-chapel. The principal entrance is by the south porch, on the gable of which is a statue of St. Edward, sitting on his throne, holding a sceptre, with the dove and the emblematical ring. The high altar is in three compartments, with carved groups in stone, representing the meeting of St. Edward and St. John the Evangelist, the latter habited as a pilgrim, the Coronation of St. Edward, and the opening of the tomb of St. Edward by St. Thomas of Canterbury. The architect is Mr. C. A. Buckler, Hereford-square, London; and the builder was Mr. James Harris, of Woking. The whole of the carving was executed by Mr. R. L. Boulton, of

Cheltenham. The edifice will seat about 150 persons.

Workington.—The new Roman Catholic Church of "Our Lady and St. Michael," at Workington, was opened recently. The building,—the style of which is Early English,—is from a design by the late Mr. E. Welby Pugin, architect, and consists of a nave, chancel, and transept, two confessionals, and a vestry. The plan is cruciform, and at the east end is a belfry, the summit of which is 90 ft. from the ground. The walls are of stone,—the ashlar work consisting of stone from the St. Bees and Aspatria quarries, and the remainder of stone from Lazonby. The clearstory is supported by eight massive pillars of polished granite, and each pillar is surmounted by the figure of an angel carved in stone. There is no gallery, and the seats in the church are open, and made of Baltic timber. At the east end is an organ-loft, and at the west end the altar, with a space on each side for side altars. The church is about 130 ft. long by 70 ft. wide, and has cost 10,000*l*. The whole of the work in connexion with the building has been performed by the contractor, Mr. Hugh Yates, of Liverpool.

Middlesbrough.—On the 3rd ult. the R.C. Bishop of Beverley laid the foundation-stone of a new Catholic Church in Sussex-street, Middlesbrough. The new church, which adjoins the schools and residence of Father Lacy, will be in the Gothic style, from plans prepared by Messrs. Goldie & Co., London. It is to accommodate some 1,200 persons, and the estimated cost is about 12,000*l*. The contractors are Messrs. Craggs & Benson, of Stockton; the clerk of the works is Mr. William Watson.

STAINED GLASS.

Cheltenham.—A stained-glass window, an anonymous gift, has recently been placed in the parish church. It is in the south side, to the west of the porch. There are two subjects, the one representing our Lord as the Good Shepherd, and the other the miracle of healing the blind man. In a panel in the tracery-piece is a dove with an olive-branch, a coloured border surrounding the light, and the spaces are filled with rose foliage. The work was designed and executed by Messrs. Bell & Son, of Bristol.

Bunbury.—A stained-glass window, in memory of the late Mr. Cawley, for a number of years agent to Lord Tollemache, was placed in its position at the west end of Bunbury Church on the 7th ult. The window is a three-light one, with tracery above, and the figures which fill it are emblematical of a wise steward, the story represented being that of Joseph as steward to Pharaoh. In the centre light is seen Joseph presiding over the selling of the corn at the time of the famine in Egypt, while before him are his brethren, in the act of purchasing and counting out the money into the hands of an Egyptian. In the left-hand light is represented the departure after buying, a servant being in the act of loading the asses, while one of the brethren stands by with uplifted face.

Lambeth.—A stained-glass window has been placed in the Church of St. Mary-the-Less, Lambeth, by the parishioners and other friends of Canon Gregory, in memory of the twenty years,—1853-1873,—during which he was vicar of the parish. The window consists of three lights, and the design and all the work connected with it has been executed by the students of the Lambeth School of Art, a school that Canon Gregory was instrumental in founding.

Elsted (*Petersfield*).—The east window of two lights has been filled with stained glass by W. H. Constable, Cambridge, at the expense of the rector, and in memory of his son. They contain the Crucifixion and Ascension of our Lord, under canopies and bases, with an inscription at bottom.

Great Shelford (*Cambridgeshire*).—The large five-light east window has been filled with stained glass. The three centre compartments contain one picture of our Lord's Ascension, extending over the three openings, and at the base the Last Supper,—under a floriated canopy. The left-hand light contains Christ bearing His Cross and the Betrayal. The right-hand light, the Crucifixion and the Entombment. The south window, of three lights, is filled with the Six Acts of Mercy. These windows are erected by the Rev. A. T. Crisford, rector, in memory of his son, and was designed and executed by W. H. Constable, of Cambridge.

Edinburgh.—The Stained-glass Windows Committee of St. Giles's Cathedral, Edinburgh, having examined the memorial window to the late Dean of Guild Lorimer, proposed to be inserted in the north wall, approved of the same, and authorised its insertion. The window has been put up in the course of the last few days, and now that this is done all the windows in the north wall are filled in with stained glass. The Lord Provost stated that he proposed to insert, at his own expense, and as a gift to the city, the great east window, and that some months ago he had instructed Messrs. Ballantine & Sons to prepare a design, which he now submitted. According to this design, the five lower lights of the window illustrate the Crucifixion, and the five upper lights the Ascension; the tracery being occupied with the angelic choir. The committee approved of the design, and authorised the work to be proceeded with. The east window will cost between 1,100*l*. and 1,200*l*. There now remains to be taken up only one window in the south wall of the choir of the cathedral, looking into Parliament-square.

Ottawa.—Messrs. Pitman & Cuthberteon have just executed a large stained-glass "Trinity" window for a church in Ottawa, representing the Ascension. In the centre compartment is the figure of our Lord within nebulæ of vesica form; the outer part of the rose foil is ornamented with vine branches; above the rising figure is a scroll, with the words "I will come again," and below, on another scroll, is the greeting, "Peace be with you." In the four smaller trefoil compartments are the emblems of the evangelists, and in the outer are floating angels.

Books Received.

Notes on Building Construction: arranged to meet the Requirements of the Science and Art Department of the Committee of Council on Education, South Kensington. Part II.: commencement of second stage or advanced course. Rivingtons.

THE second volume of this series of handbooks (to be complete in three volumes) contains further instruction on the subjects gone into in the first volume, and also such additional instruction as is necessary for students wishing to pass in the second stage or "Advanced Course" in the examinations in Building Construction in the Science and Art Department at South Kensington, except a few subjects reserved for the third volume, such as the nature of stresses and characteristics of materials used in building. The book is, of course, not intended to be exhaustive; its use would be to bring the outlines and principles of each subject before the student, and give him a starting-point from which to work out the subject further in detail from actual observation and the study of special works. Masonry and bricklaying, roofs (timber and iron), joiners' work generally, fire-proof floors, plasterers' work, glazing, riveting, are among the subjects treated of. The book is well printed and adequately illustrated; but in general it seems exceedingly conservative in its tendencies; the chapters dealing with joiner's work, for instance, treat as necessary parts of the subject various old superstitions, as one may call them, about "quirks" and "beads" and "ovolos," and sundry other ways of finishing, which were accepted as gospel by our grandfathers, but which are not always consonant in their methods with sound workmanship or in their results with architectural appearance and style. The book is, however, useful, compact, and suggestive; but not to be too implicitly followed, at least by those who desire to advance, in the science of building, beyond the standpoint of to-day, or of yesterday.

A Suggestive Hand-book of Art Criticism. By THOMAS GILKS. Pickering.

THIS is merely a small pamphlet, of such a length as might be read as an evening lecture; and to give it so high-sounding a title was rather absurd: "a few thoughts on art-criticism" would describe it more correctly. Most of the writer's remarks, taken separately, are true; but he wants himself one of the most important qualities of a critic, viz., a logical method and style. Short as his essay is, half of it is not to the point, and the connexion of the various stages of his discourse is by no means apparent: the essay is what we should call "invertebrate." It would be quite possible to lay down the lines of a theory of art-criticism within the space occupied, but to do so would involve keeping within the limits of a general but a concise and clear summary of the leading principles of the art, without going into any particulars which do not serve to enforce the main argument. Mr. Gilks, however, wanders off into passages of mere reflection and talk about this and that artist, which add nothing to his argument, and would only be in place in an extended essay on painting. The pamphlet, in short, proves nothing, though it contains agreeable writing in parts. It is prettily got up, and illustrated with four nicely-executed engravings.

A Journey due East: being a Journal of a Five Months' Trip to Lower Egypt, Palestine, and Turkey in the Winter of 1862-3. Revised edition. London: A. Hall. 1876.

THIS is what may be termed an ordinary tourist's account of his impressions of an Eastern journey fairly done; and as this is a new edition, we may presume that the book has had a certain success, and has found readers. It tells nothing new or special, however; and when the writer diverges from mere description to touch upon old and new theories in regard to history and topography, he is quite "behind the age."

The Sanitary Drainage of Houses and Towns. By GEORGE E. WARING, Jun. New York: Hurd & Houghton. London: Sampson Low, Marston, Searle, & Rivington. 1876.

ADDRESSED to householders in general, although some of the points discussed are specially intended for the information of town authorities, and intended rather as an incentive to the securing of good work than as a guide to the manner of its performance. This is the author's modest estimate of his own work, but a perusal of the book discloses further claims to attention. Writing from and of American towns and villages, the author yet has recourse to our own experiences, and quotes freely from some of our own authors. We are thus led to think that in the few passages, which we quote as follow, the author intends to refer to our own country as well as to America:—"Houses, even of the best class, which are free from sanitary objections are extremely rare. The best modern appliances of plumbing are made with almost no regard for the tendency of sewer-gas to find its way into living-rooms, nor for other insidious but well-known defects. So generally is this true, that it is hardly an exaggeration to say that unwholesomeness in our houses is practically universal. Hardly less universal is a curious sensitiveness on the part of the occupants of these houses to any suggestion of their shortcomings. Singularly enough, no one whose premises are subject to malarial influences seems willing to be told the truth with regard to them. No man likes to confess that his own well and his own cesspool occupy the same permeable stratum in his garden." This is a home-truth which is not confined to any particular country, and the consideration of it, and recognition of its truth by each individual householder, will anywhere create a wholesome demand for a proper water-supply.

The book consists of ten chapters, and we receive it with welcome, as conveying some sound and practical instruction. It would add to the value of the book if, when a second edition may be required, some information could be given bearing upon climatic influences on the process of decay of organic substances in respect of its rapidity or otherwise.

Principles of Construction and Efficiency of Waterwheels. By WILLIAM DONALDSON, M.A., Assoc. Inst. C.E. London and New York: E. & F. N. Spon. 1876.

THIS is a treatise on the principles of construction and efficiency of turbines rather than of waterwheels, as we commonly understand the term in England. The efficiency of turbines is stated to be only half the power of the water expended through them; whereas the efficiency is generally stated to be three-fourths, and in some cases even four-fifths. The author says that all waterwheels may be divided into two classes:—1. Those which are driven partly by the statical weight of the water acting through a portion of the whole fall, and partly by the momentum acquired by the water before it strikes the wheel; 2. Those which are driven only by momentum acquired by the water. But he does not appear to comprehend in this classification those wheels which are driven wholly by the weight of the water

the impulse given to it before it strikes the wheel being designed to fill the buckets merely, and not to act upon the wheel by way of momentum; and these weight-driven wheels are more efficient than wheels driven partly by momentum and partly by weight, and their efficiency is much greater than one-half of the power of the falling water.

Neither does the author seem to state the case correctly of the quantity of water discharged over a weir, in saying that, by the ordinary formula, the depth is measured directly over the weir; for, in fact, the ordinary formula requires that the depth be measured from the level of still water. A special, and not the general, formula must be used in ascertaining the quantity when the depth is measured in the manner stated by the author.

GROUND LANDLORDS OF LONDON AND THEIR TENANTS.

SIR,—Thousands will endorse your remarks concerning the evils that exist under the present system of management, and could the noble proprietors but hear a tithe of the bitter complaints and ruin to very many occupants of their shop property, through undue advantage being taken of "landlords' undue and strained rights," it would cause them to consider well the wisdom of their tenants having no further court of appeal than to their agents. I quote my own case as a sample. My father and myself have occupied the same spot over fifty years; four years since the premises were completely destroyed by fire, and most substantially rebuilt by Messrs. Holland & Hannen. Last Michaelmas my seven years' lease expired. One month previously a claim of 20*l.* was sent in from the Bedford Office for dilapidations, to be paid before any arrangement could be made for a new lease. I resisted so far as a business man dare do, with the fear of removing from a known shop, and employed professional advice; but although no dilapidations could be found, save one cracked pane, it was,—Pay or go. I elected the former, and have the receipt for dilapidations to a *new house* hanging in my office, not being able yet to harmonise it with the erection of a statue to John Bunyan at Bedford. In charity, I hope the noble Duke knows nothing of this.

The remedy seems to be a "Shop Property Act" empowering the tenant to demand, not less than three years before the expiry of his lease, the terms on which a new one will be granted, thus giving him timely notice for not fixing him in a corner to liabilities he cannot compass. There are many noble landowners who, preferring a good name to gain, could frame an equitable arrangement, and add lustre to their coronets.

WILLIAM HOWARD.

22, Great Russell-street.

Miscellanea.

Newcastle Society of Antiquaries.—The monthly meeting of this society was held on the 1st inst., in the Old Castle, Newcastle, under the presidency of Mr. R. Carr-Ellison. A letter was read from Mr. John Clayton, of the Chesters, Humshaugh-on-Tyne, in which the writer said:—I had hoped to be able to give some account of the recent discovery of Roman remains at our meeting to-morrow, but, until all the inscribed altars can be read, I feel that no account of the particulars of the discovery which would be satisfactory can be given to the society. The altars bearing inscriptions are not more than one-half of the whole number found, but the lettering on many of them is very indistinct. The well or bath described by Horsley, in his "Britannia Romana," is certainly identical with the structure now explored, which appears to me to have been a reservoir for water in the temple of a deity as yet unheard of. She appears to have been a water goddess, being represented on one piece of sculpture as floating on the leaf of a gigantic water-lily. This reservoir has at a subsequent period been used for other purposes than those for which it was originally intended, and has been made a place of deposit of coins of a low denomination for the pay of the Roman army. Two unique vases have been found with some ornamental Samian ware, and other objects of interest, of which I trust I shall be able to give a description.

A Strong Room.—Messrs. Chubb & Son have just completed, at their works in Glengall-road, a large fire-resisting strong room for a London bank. It contains a lobby in which will stand several iron safes. The remainder of the room is subdivided into two principal strong closets, one to receive safes for cash, bullion, &c.; the other and largest compartment being fitted up on all sides, from floor to roof, with tier upon tier of iron shelves. The outer door is constructed of wrought iron and hard steel, weighing nearly a ton, and is secured by two of Chubb's locks throwing bolts all round its four sides. A folding grille in the doorway is used to ventilate the room by day while the door remains open. The room measures 20 ft. by 12 ft., and 9 ft. high, and weighs about 23 tons.

The Boileau Drinking Fountain, Norwich. The drinking-fountain, for the erection of which at the junction of the Ipswich and Newmarket roads, Norwich, the late Sir John Peter Boileau bequeathed the sum of 1,000*l.*, was unveiled on the 30th ult. Some years elapsed after the death of Sir John before the Corporation finally gave their consent to the erection of the fountain on the site stipulated, and the work since its commencement, from one cause or another, proceeded but tardily. But no pains have been spared by Sir Francis Boileau and his co-executors to carry out the wishes of the testator. The fountain is a lofty, richly-decorated red-brick structure, consisting of a canopy supported at each corner by pillars, and beneath the canopy is a life-size bronze figure of a seated woman, representing Charity, giving water from a shell to a child standing at her knees. This figure rests upon a square pedestal containing the taps and basins. The canopy is richly decorated. It is in moulded bricks. One tympanum contains the arms of the donor, while the opposite one contains the arms of the city. The other tympani contain floral work. All the work, save the group in bronze, was designed by Mr. T. Jeckyll, the statuary being designed and executed by Mr. J. E. Boëhm, sculptor. The ornamental paterræ, &c., of the canopy were cut by Mr. Minns, of Heigham; the brickwork was executed by Mr. Hubbard, of Dereham; and the water apparatus supplied by Messrs. J. & J. King.

Architects' Commission at Winchester.—At a meeting of the Winchester Town Council, on the 2nd inst., a report was presented by the Finance Committee recommending payment of bills due, 653*l.*, on the city account, including Mr. Pocock's (architect) professional charges for the erection of galleries, &c., at the Guildhall. Mr. Jones, in reference to this latter sum, pointed out that it was more than 20 per cent. on the amount of the builder's contract, 398*l.* He thought it was an enormous charge, and one which should make them careful in the future. Mr. Councillor Stopher (who is himself an architect) said he would rather not have had occasion to say a word about the architect's charges, but he could not allow it to go forth to the public that these charges related solely to the construction of the new galleries, for there was a sum of 15*l.* 15*s.* for the plans of a new room and kitchen which were not carried out, and there was the cost of several visits from London, and the usual commission of 5 per cent. would not cover those. The report was adopted.

The New Viaduct at Carlisle.—A Carlisle paper states that the abutment of the Corporation Viaduct on the east side of English Damside is now up to "springer" height, and the contractor is engaged in making the foundation for the second pier eastward. In carrying out this work some difficulty has been experienced. At a depth of 10 ft. the workmen came upon an old Roman way, paved with cobbles set in hydraulic mortar, and so firmly embedded that it could only be broken through by the use of bars and sledge hammers. Below this old roadway a stratum of soft earth was found, and it was not until a depth of nearly 18 ft. had been sunk that a gravel foundation was reached. This is now being made the foundation of the superstructure by the use of concrete and rough rubble. The new Nelson Bridge is now nearly finished, and if no check comes in the way it is hoped the Viaduct may be opened for use by about the month of May.

Public Baths for Northampton.—Messrs. P. & R. Phipps have for some time past had under their consideration plans drawn up by Mr. William Hull, architect, for the erection of a large swimming-bath, &c., on the ground at the rear of the Half Moon Inn, Bridge-street. The project has now assumed definite shape, the contract of Messrs. Dunkley, of Blisworth, for the work, having been accepted, the estimated cost being 1,400*l.* The building will face the new road leading by the Cattle-market to the South-bridge. Red bricks, relieved by Casterton stone, will be used in the façade, which will be of two stories. The swimming-bath will be 63 ft. by 25 ft. in extent, and from a depth of 3 ft. 6 in. at one end, will gradually deepen to 7 ft. 6 in. at the other. There will be twenty dressing-rooms round the side of the interior, with the usual accessories.

St. John's, Chelsea.—The architects of St. John's Church, mentioned in our last, were Messrs. Newman & Arthur Billing.

Destruction of an Old Railway Bridge near Edinburgh.—On the 5th inst. a bridge across the Caledonian Railway immediately beyond Dalry was destroyed by means of dynamite, being no longer necessary in view of the new structure now being thrown across the line at a point which will give direct communication between the villas at Merchiston and the houses on the other side of the railway. Preparations for the explosion had been made on the previous night, so that after the London train passed in the morning all requiring to be done was to lay sleepers above the rails for their protection. The charge of dynamite used was a large one, and the cartridges having been inserted in a cutting carried across the key-stones of the arch, the result of the blast was the instant demolition of the bridge. The work was carried out under the superintendence of Mr. Stoddart, district engineer on the Caledonial Railway.

Preserving Timber.—The improvements in saturating wood and timber, invented by Mr. H. Sainsbury, of Paris, consist in employing a solution formed in the relative approximate proportions of water, 1,000 litres; alum, 16 kilos.; sulphate of copper, 16 kilos.; bromide of sodium, 1 kil.; and iodide of sodium, 1 kil. For the purpose of the invention he prefers placing the timber or wood to be treated in a close vessel from which he draws off all the air, and in which he immediately injects the above-mentioned liquid with a pressure varying from 15 lb. to 150 lb. to the inch. It is stated that wood thus injected not only acquires thereby a considerable degree of hardness, whereby it is better fitted to resist wear and tear, friction, exposure to the atmosphere, and deteriorating causes, but it is also rendered completely incombustible.

Royal Scottish Academy.—At a general meeting of the Royal Scottish Academy, held on the 8th inst., Mr. William Brodie, R.S.A., was elected secretary, in the room of Mr. J. Dick Peddie, resigned. At the same meeting, Mr. R. Anderson, architect, was elected an Associate of the Academy, in the room of Mr. George Hay, who in February last was promoted to the rank of Academician. Another vacancy exists in the list of Associates, occasioned by the recent death of Mr. Thomas Clark; but this, it is stated, will not be filled till November, 1877. In February next there will, it is understood, be an election of Academicians to supply the places of Sir George Harvey, Mr. David Bryce, and Mr. R. T. Ross; and as these blanks will be made good from the Associates, three additional vacancies will be created in that body.

The Late Mr. C. J. Hemans.—We have heard with great regret of the death, at Lucca, of Mr. Charles J. Hemans, a son of Mrs. Hemans, the poetess. Mr. Hemans left England in early life, and, after residing in various parts of the Continent, finally settled in Italy, and latterly in Rome. It was here that his chief studies were made in history and archæology. His more recent ones, "A History of Mediæval Christianity and Sacred Art in Italy," and "Historic and Monumental Rome," contain the results of his most mature studies. Mr. Hemans was for a long time our correspondent, and our earlier volumes contain a series of valuable articles by him descriptive of the antiquities of the Eternal City.

Chicago Ironworks.—The growth of ironwork in the Western States is well illustrated in the case of Chicago, which is situate remote not only from the iron mines, but also from coal suitable for the purpose. Of the ten Bessemer steel works in the United States two are located in Chicago, and of the 291,000 tons Bessemer steel rails made in the country last year, 85,000 tons, or nearly one-third of the entire amount, were made in Chicago. The iron industries have 200 establishments, employ 10,000 workmen, and manufacture to the amount of $35,000,000 annually.

The Artisans', Labourers', and General Dwellings Company (Limited).—On the 8th inst. the shareholders in the Artisans', Labourers', and General Dwellings Company (Limited) invited about three hundred of their workmen to a "raising feast" at the Westminster Palace Hotel, to celebrate the partial completion of the large batch of houses the company are now erecting on their Queen's Park estate. Dr. Baxter Langley presided. It was stated by one of the workmen on the estate that the company, during the nine years of their existence, have never had a serious dispute with their men.

Birmingham Society of Artists.—On the 10th inst., Mr. J. T. Bunce delivered a lecture, at the rooms of the Birmingham Society of Artists, on the Life of David Cox. Cox's life, Mr. Bunce said, was free from dark shades as it was from brilliant lights; it was noble in the greatest sense, and was valuable in an incalculable degree, having opened a world of beauty and a vast region of instruction and enjoyment to those who without that aid could not have interpreted, and would have failed to enter upon either.

Overcrowding at Swansea.—A serious case of overcrowding came before the Swansea magistrates on the 31st ult. The house alluded to was No. 3, James-court, James-street, and Mr. Inspector Thomas, who brought the case forward, proved that in a small room, 11 ft. 3 in. by 11 ft. 6 in., nine and sometimes ten persons slept. There were thus only about 82 cubic feet of air for each person, instead of 250 or 300 ft., as required by the Act. The stipendiary gave orders that the parties should at once remove from the premises.

Wigan Benefactors.—A public meeting of ratepayers at Wigan has resolved to adopt the Public Libraries Act in the town. Mr. Thomas Taylor, cotton-spinner, at his own expense, and at a cost of nearly 10,000*l.*, has almost completed the erection of a building, which is to be presented to the town, for the purposes of a free library; and in addition to this, Mr. Winnard, surgeon, left by his will a sum of 10,000*l.* for the purchase of books.

Chester Archæological and Historic Society.—The opening meeting of the session of the Chester Archæological Society was held in the Society's room, Lower Bridge-street, when Mr. Beamont, of Orford Hall, delivered an interesting address on "The Obsolete Peculiarities of English Law."

New Shoreham Church.—The architect engaged, Mr. A. Loader, says that the letter in our last issue in reference to the works now being carried on at New Shoreham Church is "entirely void of truth." The same statement has, nevertheless, been made to us by another correspondent.

Mechanics' Institute, Leeds.—The interior of the Albert Hall here has been decorated. The directors have laid out 1,000*l.* upon the ornamentation. The sunlight overhead is lighted up by electricity. Messrs. W. Perkins & Sons, of East Parade, were the architects employed.

TENDERS

For cemetery chapels, lodge, &c., at Bromley, Kent. Mr. George Truefitt, architect. Quantities by Mr. Morris Evans:—

Taylor	£3,950 0 0
Payne & Balding	3,845 0 0
Coles	3,744 0 0
Staines & Son	3,582 0 0
Prebble	3,545 0 0
Carter	3,530 0 0
Copping	3,320 0 0

For roads and drainage at Bromley Cemetery, Kent. Mr. George Truefitt, architect. Quantities by Mr. Morris Evans:—

Coles	£874 0 0!
Heath	613 0 0
Hawkes	530 0 0
Payne & Balding	518 0 0
Prebble	496 0 0
Copping	460 0 0
Lansbury	399 0 0!

For the erection of a pair of semi-detached villas, at Great Marlow, for Mr. C. Jubber. Mr. Chas. Carter, architect. Quantities supplied:—

Silver & Son	£1,620 0 0
Woodbridge	1,507 0 0
Carter	1,495 0 0
Plumridge	1,460 2 0

For building house and stables, Heron-road, Brixton, for Mr. Havill. Messrs. Habershon & Pite, architects:—

	House.	Stables.
Haynes	£550 0 0	£250 0 0
Edworthy	534 0 0	244 0 0
Judd & Hawkings	526 0 0	217 0 0
Taylor	515 0 0	203 0 0
Leathley	485 0 0	200 0 0

For Primitive Methodist Chapel, Bromley, Kent. Mr. A. J. Rouse, architect. Quantities supplied:—

Stephenson	£1,054 0 0
Taylor & Son	1,019 0 0
Wyeth	983 0 0
Cox & Son	977 0 0
Ridge & Kingsland	947 0 0
Prebble & Co.	940 0 0
R. & E. Smith	939 0 0
Parker & Evans	938 0 0
Willis	935 0 0
King & Brown	880 0 0
Lose	795 0 0
Hocking	760 0 0
Copping (accepted)	752 0 0

Accepted for alterations to the Sunderland and North Durham Liberal Club. Mr. J. W. Rounthwaite, architect:—

Bricklaying, Masonry, &c.	
T. & A. Cooke	£182 10 0
Joinery and Carpentry.	
Hodgson	277 10 0
Slating.	
Nelson	32 10 0
Painting and Glazing.	
Kirkup	139 14 0
Plumbing and Gasfitting.	
Hudson	20 0 0

For ten houses and one house and shop in Wellington-street, Whitechapel, for Mr. M. Samuels. Mr. Edward Clarke, architect. Quantities supplied:—

Crockett	£4,676 0 0
Jarvis & Sons	4,599 0 0
Cohen	4,573 0 0
King & Brown	4,561 0 0
Tully	4,537 0 0
Davis	4,511 0 0
Richardson Bros.	4,478 0 0
Aitchison & Walker	4,323 0 0
Wythe	4,297 0 0
Lewis	4,288 0 0
Mattock & Co.	4,126 0 0
Hutchinson Bros.	4,100 0 0
Judd & Hawkings	4,028 0 0
Howard	3,974 0 0
Brealy	3,893 0 0
Oliver	3,823 0 0
Andrews & Co.	3,802 0 0
Cocks & Co.	3,785 0 0

For alterations at the Castle Inn, Stratford New Town, for Mr. Thomas Proctor. Mr. Edward Brown, architect:—

Stamp & Bowtle	£325 0 0
Pringle	249 0 0
Salt (accepted)	208 0 0

For alterations (exclusive of painting, glazing, and decorating) to 64, Church-street, Greenwich, for Mr. R. B. Fountain. Mr. Henry Roberts, architect:—

Holding & Son	£406 0 0
Smith	280 0 0
Sanderson (accepted)	243 10 0
Wheeler	242 0 0

For warehouse and manufacturing premises in Whitecross-street, E.C. Messrs. Ford & Hesketh, architects:—

Dove Bros.	£,706 0 0
Kirk & Randall	8,671 0 0
Downs & Co.	8,668 0 0
Lawrence	8,662 0 0
Newman & Mann	8,628 0 0
Peto Bros.	8,621 0 0
Brass	8,524 0 0
Browne & Robinson	8,430 0 0
Ashby Bros.	8,353 0 0
Merritt & Ashby	8,245 0 0
Crabb (accepted)	7,929 0 0

For warehouse in Jewin-street, E.C. Messrs. Ford & Hesketh, architects:—

Morter	£2,833 0 0
Merritt & Ashby	2,819 0 0
Lawrence	2,786 0 0
Brass	2,755 0 0
Browne & Robinson	2,643 0 0
Ashby & Horner	2,591 0 0
Ashby Bros.	2,554 0 0
Boyce	2,513 0 0
Crabb (accepted)	2,165 0 0

For painting the interior of the Borough Market, Southwark. Messrs. Henry Jarvis & Son, architects:—

Baguley	£805 0 0!
Downs	587 0 0
Sayer	415 0 0
Knight & Son	398 0 0!

For rebuilding premises, Laygate-lane and Brunswick-street, South Shields, for Mr. R. Breuninger. Messrs. Penning & Rudge, architects. Quantities by the architects:—

Joeurs (accepted)	£949 0 0

For rebuilding premises in Fowler-street, and Denmark-street, South Shields, for Mr. R. Jackson. Messrs. Penning & Rudge, architects. Quantities by the architects:—

Mouat	£725 14 2
A. & P. Marshall	685 0 0
Joeurs	607 0 0
Shields (accepted)	589 0 0

For new public-house, High Bridge, Newcastle-on-Tyne. Messrs. Penning & Rudge, architects. Quantities by the architects:—

Harrison	£1,815 1 6
Maughan	1,713 8 0
Suddards	1,684 2 10
Hutchinson	1,668 0 0
Harbottle	1,515 0 0
Atkinson	1,509 0 0
Nichol	1,410 0 0
Simpson* (accepted)	1,441 5 10

* Extra for patent facing bricks, 80*l.*

Ironwork.

Hall (accepted)	£85 0 0

For additions to the Southwark Branch of the London and Westminster Bank. Mr. E. N. Clifton, architect. Quantities supplied by Messrs. Williams & Gritten:—

Holland & Hannen	£6,057 0 0
Brass	5,789 0 0
Lawrence	5,777 0 0
Conder	5,644 0 0
Macey	5,552 0 0
Peto Brothers	5,482 0 0

For the completion of St. Andrew's Church, Croydon:—

Hobbs (accepted)	£1,350 0 0

For erecting four houses in Upland-road, Peckham, for Messrs. Ross & Co. Mr. W. Paice, architect:—

Stowell (accepted)	£1,800 0 0

TO CORRESPONDENTS.

R. T. (we prefer not to advise. We would not spend any money upon it.)—S. T.—A.—G. T.—A. J. S.—A. B.—A. B. M.—H. S.—Mrs. B.—J. & H.—C. & Son.—C. C.—R. W.—A. L.—A Sussex Architect.—Old Shoreham.—Provincial Architect.—J. K. C.—J. P. S.—J. C. C.—R. C. P.—C. E. P.—C. C.—H. E.—H. H.—W. E.—Genl. N.—R. C.—C. H.—J. M. R.—H. J. & Son.—J. G. R.—H. R.—M. P.—W. S.

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